NAVAL POSTGRADUATE SCHOOL Monterey, California



19990419 039

THESIS

IMPLEMENTATION OF A PORTABLE PSDL EDITOR FOR THE HETEROGENEOUS SYSTEMS INTEGRATOR

by

Ilker Duranlioglu

March 1999

Thesis Advisor:

Man-Tak Shing

Approved for public release; distribution is unlimited.

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.

| 1. AGENCY USE ONLY (Leave blank) | 2. REPORT DATE March 1999 | 3. REPORT T COVERED Master's Th | YPE AND DATES |
|---|------------------------------|---------------------------------------|---|
| 4. TITLE AND SUBTITLE IMPLEMENTATION OF A PORTABLE PSDL SYSTEMS INTEGRATOR | EDITOR FOR THE HETEROGE | ENEOUS | 5. FUNDING NUMBERS |
| 6. AUTHOR(S) Duranlioglu, Ilker | | : | |
| 7. PERFORMING ORGANIZATION NAME(S) AND AD Naval Postgraduate School Monterey, CA 93943-5000 | DRESS(ES) | | 8. PERFORMING ORGANIZATION REPORT NUMBER |
| 9. SPONSORING / MONITORING AGENCY NAME(| S) AND ADDRESS(ES) | | 10. SPONSORING / MONITORING AGENCY REPORT NUMBER |
| 11. SUPPLEMENTARY NOTES | | | |
| The views expressed in this thesis are those the Department of Defense or the U.S. Gove | | e official poli | cy or position of |
| 12a. DISTRIBUTION / AVAILABILITY STATEMENT | | | 12b. |
| Approved for public release; distribution is un | limited. | | DISTRIBUTION CODE |
| 13. ABSTRACT (maximum 200 words) | | | |

The Computer Aided Prototyping System (CAPS) is an integrated set of tools that is used for rapid prototyping of real time systems. Prototype System Description Language (PSDL) is the prototyping language that captures the requirements and produces executable prototypes. Prototypes can be created by using specially designed PSDL Editor, which can automatically generate PSDL code from data flow graphs. The Heterogeneous Systems Integrator (HSI) is an extension to CAPS, designed to automate the process of integrating complex distributed systems, where the subsystems can reside on different locations, be implemented in different hardware, operating systems and programming languages.

It is envisioned that the HSI will be a distributed system itself. Users at remote sites need not install the entire HSI system, but only the User Interface for entering the PSDL specification of the target systems. This research is the first step in the evolution of HSI. The focus is to create a portable user interface, which can be used in any environment (hardware and operating system).

We have designed and implemented a platform independent HSI user interface using the Java programming language. The functionalities of CAPS Release 2.0 PSDL Editor are mainly preserved in this implementation with a few added features. The new editor shows significant improvement in performance and user friendliness over the previous versions of CAPS PSDL Editor.

| 14. SUBJECT TERMS Rapid Prototyping, User Interface | • | | 15. NUMBER OF PAGES 304 |
|---|---|--|--|
| | | | 16. PRICE CODE |
| 17. SECURITY CLASSIFICATION OF REPORT Unclassified | 18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified | 19. SECURITY CLASSIFI- CATION OF ABSTRACT Unclassified | 20. LIMITATION OF ABSTRACT UL |

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89) Prescribed by ANSI Std.

Approved for public release; distribution is unlimited

IMPLEMENTATION OF A PORTABLE PSDL EDITOR FOR THE HETEROGENEOUS SYSTEMS INTEGRATOR

Ilker Duranlioglu
Lt.J.G. Turkish Navy
B.S., Turkish Naval Academy, 1993

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

from the

NAVAL POSTGRADUATE SCHOOL March 1999

Author: Ilker Duranlioglu

Approved by:

Man-Tak Shing, Thesis Advisor

Chris Eagle, Second Reader

Dan Boger, Chairman

ABSTRACT

The Computer Aided Prototyping System (CAPS) is an integrated set of tools that is used for rapid prototyping of real time systems. Prototype System Description Language (PSDL) is the prototyping language that captures the requirements and produces executable prototypes. Prototypes can be created by using specially designed PSDL Editor, which can automatically generate PSDL code from data flow graphs. The Heterogeneous Systems Integrator (HSI) is an extension to CAPS, designed to automate the process of integrating complex distributed systems, where the subsystems can reside on different locations, be implemented in different hardware, operating systems and programming languages.

It is envisioned that the HSI will be a distributed system itself. Users at remote sites need not install the entire HSI system, but only the User Interface for entering the PSDL specification of the target systems. This research is the first step in the evolution of HSI. The focus is to create a portable user interface, which can be used in any environment (hardware and operating system).

We have designed and implemented a platform independent HSI user interface using the Java programming language. The functionalities of CAPS Release 2.0 PSDL Editor are mainly preserved in this implementation with a few added features. The new editor shows significant improvement in performance and user friendliness over the previous versions of CAPS PSDL Editor.

TABLE OF CONTENTS

| I. | INTRODUCTION | 1 |
|------|--|-----|
| | A. COMPUTER AIDED PRTOTYPING SYSTEM | 2 |
| | B. CAPS RELEASE 2.0 GRAPH EDITOR | 4 |
| | C. RESEARCH GOAL | 7 |
| П. | REDESIGNING CAPS MAIN PROGRAM | |
| | A. PROTOTYPE DIRECTORY STRUCTURE | 9 |
| | B. CREATING A NEW PROTOTYPE | 9 |
| | C. OPENING AN EXISTING PROTOTYPE | 10 |
| | D. INVOKING THE GRAPH EDITOR | |
| | E. EXITING THE PROGRAM | 10 |
| III. | USER INTERFACE DESIGN | |
| | A. ARCHITECTURE OVERVIEW | |
| | B. DATA STRUCTURES | 14 |
| | C. PSDL MAPPING | |
| | D. SYNTACTIC VALIDATONS | 17 |
| IV. | USER INTERFACE IMPLEMENTATION | |
| | A. PSDL EDITOR ENVIRONMENT | |
| | B. DATA FLOW DIAGRAM | |
| | C. CHANGING COMPONENT PROPERTIES | 42 |
| V. | CONCLUSION | 45 |
| | IDIX A PSDL GRAMMAR | |
| APPE | IDIX B PSDLBUILDER.JJ AND PSDLGRAMMAR.JJ | 57 |
| APPI | IDIX C DOCUMENTATION | 83 |
| APPI | DIX D SOURCE CODE | 201 |
| LIST | F REFERENCES | 293 |
| INIT | J. DISTRIBUTION LIST | 295 |

I. INTRODUCTION

The classic Waterfall Model for software development consists of five phases (Figure 1). Among these, the Requirements Analysis phase has special importance. The development efforts start with the description of requirements. This is generally not very easy, because few customers use formal descriptions and frequently, they may not be able to fully describe what they want. It is the job of software developers to discover missing or forgotten requirements, and to understand what the customer actually wants to see in the end. The product may be perfectly error free, but it is useless if it does not reflect the needs of the customers.

Rapid software prototyping is an iterative software development methodology and its purpose is to improve the analysis, design and the development of software systems [Ref. 1].

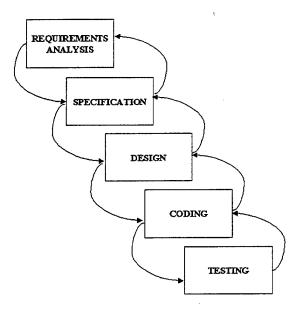


Figure 1. Waterfall Model

A prototype is a simplified model of a proposed system [Ref. 2]. Prototypes improve customer–developer communication by demonstrating the feasibility, behavior or performance of the desired product. Hence, the customer can have a better view of his/her needs. This helps developers in identifying the requirements via the feedback from the customers.

A. COMPUTER AIDED PROTOTYPING SYSTEM (CAPS)

Computer Aided Prototyping System (CAPS) is a prototyping tool that is developed by the Naval Postgraduate School Software Engineering Group. CAPS provides automated generation of executable prototypes. The prototype, in turn, helps in capturing the requirements of the end user.

Real time systems are generally very complex and hard to analyze. CAPS provides tools that has been specifically designed to support prototyping of such complex systems. CAPS has easy to use visual tools that capture the high level properties of systems, which in turn produce a formal description in a high-level prototyping language and then generate executable code.

The tools that CAPS uses are Editors, Software Base, Execution Support and Project Control (Figure 2). The prototyping language that CAPS is based upon is the Prototype System Description Language (PSDL).

PSDL is a high level language which helps to specify prototypes. The system is decomposed into subsystems using data flow diagrams. Data streams provide the communication between the subsystems.

The editors that CAPS provides are the PSDL Editor, Source Code Editor and GUI Interface Editor. The primary editor is the PSDL Editor, which is specifically designed to build PSDL prototypes. The prototypes are viewed as augmented data flow graphs in the PSDL editor. As the prototype is being built using the PSDL Editor, the data flow graph is translated automatically into PSDL code in the background and syntactic checking of the prototype is performed as well. The Source Code Editor is used to develop the software packages that will be used in the prototype and the GUI Interface

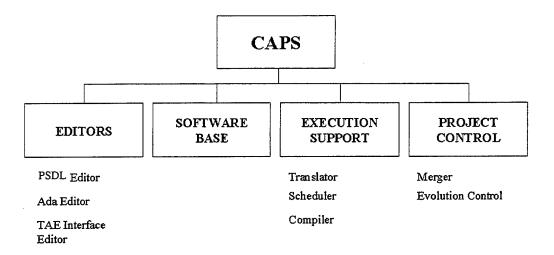


Figure 2. CAPS Subsystems

Editor helps to build Graphical User Interfaces for the prototype.

The Software Base contains reusable prototype components. These components can be retrieved by queries or by browsing the repository once the database is established. This feature saves time by reusing existing components rather than rewriting them each and every time. In the current version of CAPS, the Software Base is not yet implemented.

The Execution Support system contains automated tools to rapidly construct prototypes of real time systems. It consists of a translator, a scheduler, and a compiler. The translator generates code that binds the reusable components that are taken from the software base. The scheduler is invoked before the execution of the prototype to arrange appropriate time slots for the components that have real time constraints. If the scheduler

successfully completes its execution, all of the time-critical operators are guaranteed to meet their timing requirements even in worst case scenarios [Ref. 3]. The scheduler also produces a low-priority dynamic schedule that runs during the execution of the prototype and allocates time slots for components that do not have real time constraints. These components are scheduled to run during the time slots that are not scheduled for any of the time critical operators. Finally, the compiler compiles the generated source code into executable binary code.

B. CAPS RELEASE 2.0 GRAPH EDITOR

The current PSDL Editor of CAPS is mostly implemented by Kenneth Moeller in his thesis research [Ref. 4]. The implementation consists of two parts. The first part is the user interface used to build the prototypes. The users of CAPS interact only with this interface. A prototype is built by using data flow diagrams and the graph editor automatically translates the diagrams into PSDL code. The second part of the editor is a background checker, which is actually a parser to check the syntactic correctness of the PSDL code. The parser is invoked following certain events such as changing the level in the hierarchy of the prototype or saving the prototype into disk.

Figure 3 shows the PSDL Editor of CAPS. It basically consists of a Menu Bar, a Tool Bar and a drawing area for the PSDL prototypes. This section will very briefly describe the graph editor and its functionalities.

The drawing area can be thought of as a very limited drawing application. It is used to build the PSDL prototypes. The prototypes are built as a hierarchy of operators. An operator represents the subsystems of the intended software. Only one level of the hierarchy can be viewed and edited at a time. The user can perform certain operations in the drawing area such as inserting an operator, inserting a data stream, editing the properties of operators and streams and moving the location of the operators and streams.

The Tool Bar has eight buttons that choose the operation to be performed in the drawing area. Selecting the appropriate button from the toolbar and clicking into the drawing area will draw an operator or a data stream. The select button allows selection

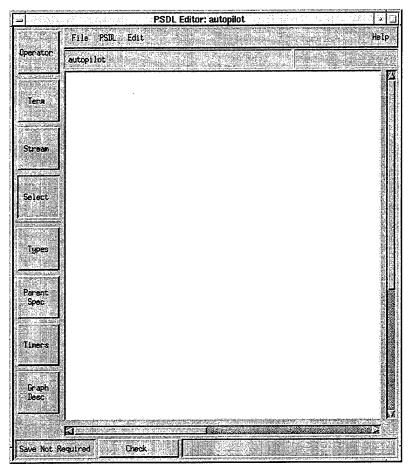


Figure 3. CAPS Graph Editor

of an operator or a data stream within the drawing area.

The Menu Bar consists of four menus. The file menu involves actions to save the prototype to the disk, restore a prototype from the disk, abandon changes that have been made, print the diagram and exit the PSDL editor. The PSDL menu has actions to change the level in the hierarchy by either decomposing the current operator or shifting to the parent or the root operator. Users can change colors or fonts from the edit menu. Undeleting an operator is also available from the edit menu. Finally, the help menu includes online information about PSDL concepts that can be browsed very quickly.

It is possible to change the properties of an operator. A pop-up dialog (Figure 4) is opened when the user clicks on an operator with the right mouse button. It allows user to

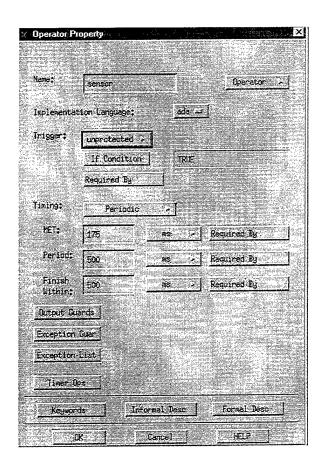


Figure 4. Operator properties pop-up menu

| Stream Property → | |
|--------------------|-------------|
| Stream Name: | temperature |
| Stream Type: | float |
| Is a state stream? | †No ∳Yes |
| State durant faile | |
| Latency: | NS A |
| | |
| OK E | ancel HELP |

Figure 5. Stream properties pop-up menu

change various properties and timing requirements for the operator. A similar but simpler pop-up dialog is available for the properties of data streams as well (Figure 5).

C. RESEARCH GOAL

The rapid prototyping of CAPS will be extended in future into a Heterogeneous Systems Integrator (HSI), which will be used to automate the process of integrating complex distributed systems. The requirements for HSI are not specified as of the time of this research. The main idea is to have HSI reside on a server. Clients will enter their PSDL specification of the system using a PSDL Editor, send the PSDL specification to the server and receive back an executable prototype. Users need not install the entire HSI system, only the PSDL Editor will be needed to build prototypes at the remote site.

The main disadvantage of the current CAPS PSDL Editor is that it is implemented in C++ and can only be executed under Unix environments. A portable implementation of the PSDL editor is needed to build PSDL prototypes under any environment. The goal of this research effort is to overcome these limitations by reimplementing the PSDL Editor using a platform independent programming language.

We have chosen the the Java* programming language for this purpose. Java is a programming language developed by Sun Microsystems and has gained popularity in recent years with the developments in the Internet. Java allows programs to run on different platforms without recompiling them. The main reason why Java is so popular is that small Java programs called Applets can be used to enhance web pages over the internet.

The current CAPS PSDL editor is the basis for our implementation. However, it is not a one-to-one translation from one language to another one. Some new features are added as well. These will be introduced in Chapter III and Chapter IV in detail.

^{*} Java is a trade mark of Sun Microsystems.

II. REDESIGNING CAPS MAIN PROGRAM

The Heterogeneous Systems Integrator (HSI) PSDL Editor is not a stand-alone program. To edit an existing prototype or to create a new prototype, the HSI main program must be executed first. The PSDL Editor is invoked from the main program. Thus, together with the PSDL Editor, the main program also had to be reimplemented. The new implementation is very similar to CAPS Release 2.0, except that it currently only allows to open/create a prototype and to invoke the PSDL Editor on that prototype.

A. PROTOTYPE DIRECTORY STRUCTURE

Prototypes are placed in a directory structure similar to the CAPS Release 2.0. The program will look for the "PROTOTYPEHOME" environment variable first. If this variable is set as a command line argument, the program will use that directory to find existing prototypes or to create new prototypes. If it cannot find such a variable, then the user home directory will be used as the default "PROTOTYPEHOME".

Prototypes will be placed in the ".caps" sub directory under the "PROTOTYPEHOME" directory. A new sub directory will be created under ".caps" directory for each prototype having the same name as the prototype. Each prototype directory will have different versions of the same prototype as "1.1", "1.2" and so on.

B. CREATING A NEW PROTOTYPE

Selecting the "New" menu item under the "Prototype" menu will launch an input dialog asking the user to input the name and the version of the prototype. This dialog provides two text boxes to enter the name of the prototype and the version of the prototype. If the user leaves the version text box blank, the version number for the prototype will be automatically accepted as 1.1.

A new directory will be created under ".caps" directory containing the prototype name that is entered by the user. The version number is also created as a directory under the prototype directory. This directory will contain the PSDL prototype file, which will be created by the PSDL Editor.

The user may enter a prototype name with a version number that corresponds to an existing prototype. This may be due to a mistake or that he/she may want to overwrite an existing prototype. In this case, HSI will issue a warning message telling the user that they are about to overwrite an existing prototype. The operation may then be continued or cancelled.

C. OPENING AN EXISTING PROTOTYPE

When the "Open" menu item is selected under the "Prototype" menu, the program will look for existing prototypes under the ".caps" directory and list them in a selection box. A different selection will exist in the selection box for different versions of the same prototype.

D. INVOKING THE GRAPH EDITOR

After creating a new prototype or selecting an existing prototype, the user can open the PSDL Editor by selecting "PSDL" menu item from the "Edit" menu. If no prototype is selected, the program will show an error message.

It is possible to edit more than one prototype at the same time, however the program will not allow more than one instance of the same prototype at the same time. An attempt to run the PSDL Editor with the same prototype will result in an error message.

E. EXITING THE PROGRAM

The program will exit either when the "Quit" menu item is selected from the "Prototype" menu, or when the user clicks on the window close icon. In both cases, the program will prompt the user if the current prototypes are not saved. The user can choose to save the prototype, cancel the 'quit' operation or close the program without saving the prototypes.

III. USER INTERFACE DESIGN

The main idea behind this implementation was to build a PSDL editor that was platform independent. We tried to capture all the functionalities of the PSDL Editor that was used in CAPS Release 2.0. PSDL mappings from and to the PSDL Editor are the same. Some new features are added to provide a user-friendlier interface. LCDR. Chris Eagle created a preliminary Java version of the CAPS PSDL Editor that had both application and applet versions. We adopted some of his ideas and most of his class hierarchy in this implementation. The complete source code for this implementation can be found in Appendix D. The documentation of the source code is created by using Javadoc and can be found in Appendix C.

A. ARCHITECTURE OVERVIEW

The HSI main program runs as one thread of execution. Each PSDL Editor that is launched by the HSI main window has a separate thread of execution as well. As described in Chapter 2, it is possible to edit more than one prototype at the same time. However, no two prototypes can be launched using the same prototype file. There are no shared variables used by these threads. Thus, no synchronization procedure is necessary among the threads and none is provided.

1. Program Packages

The program consists of six packages and several classes in these packages. The classes are packaged according to their functionality in the program. Figure 6 shows the hierarchy of the packages. The packages also represent the directory structure of the program.

The images that are used in the program are under the caps.Images directory. They are referred to by using this directory structure in the program.

a. Package caps.Builder

Package caps. Builder contains the classes that are responsible for reading a PSDL prototype file and to construct the data structures that are used to represent the data flow diagram

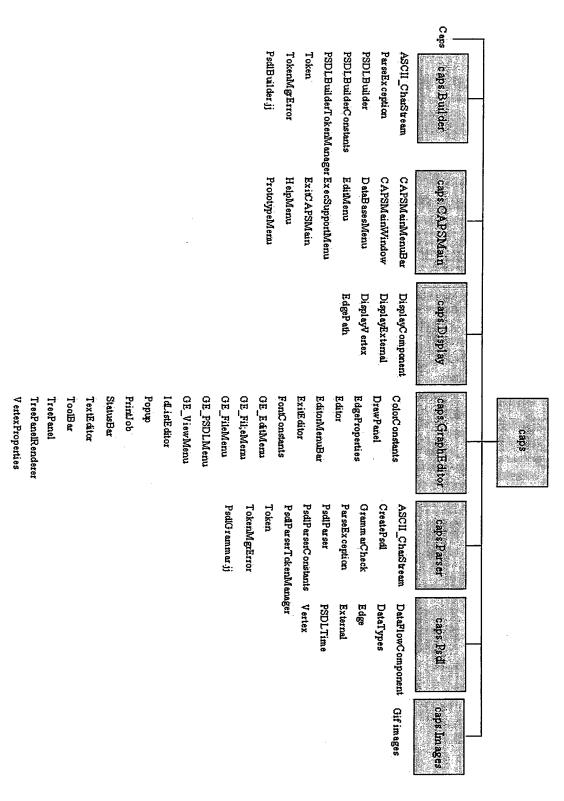


Figure 6. HSI Packages

in the PSDL Editor. PSDLBuilder.jj is the JavaCC source file that is used to create the classes in the package.

PSDLBuilder is the program that parses the PSDL file and creates the data structures. The other classes are used for functionalities such as providing tokens. PSDLBuilder contains the semantic actions, which are actually embedded Java code that creates the prototype.

As the classes in this package are created by JavaCC, we did not provide any documentation for these classes in Appendix C. The source code is quite difficult to read. Because of that, it is more convenient to read the PSDLBuilder.jj file instead of the others. Any change to the classes in this package should be first made to PSDLBuilder.jj. Then, it must be recompiled by JavaCC.

b. Package caps.CAPSMainWindow

This package contains the main HSI program that is necessary to run the PSDL Editor.

c. Package caps.Display

Display package contains the classes that are used to model the graphical representation of the PSDL prototype. The data structures that are used in this package are explained later.

d. Package caps.GraphEditor

GraphEditor package contains the classes that implement the user interface components of the PSDL editor.

e. Package caps.Parser

The PSDL parser is created by PSDLParser.jj. JavaCC is used to create the parser files from PSDLParser.jj. The parser is used within the PSDL editor to validate user inputs. If the user input is not accepted by the parser, a ParseException is thrown. This is reflected to the user by an error message. The parser accepts the user input if it does not violate the grammar rules.

The grammar rules that are used to create the parser are the same as Appendix A. Appendix B contains PSDLParser.jj and PSDLBuilder.jj for reference. Like the PSDLBuilder package, no documentation for the classes of this package is provided. The source code of this package is difficult to trace. We recommend to refer to PSDLParser.jj file. Again, any changes to

the source code must be made via the PSDLParser.jj file. This file then must be compiled by JavaCC to create the parser.

f. Package caps.PSDL

The caps.PSDL package contains the classes that implement the data structures that are used to represent the PSDL prototype.

2. The Architecture

The HSI program consists of the main program and the PSDL editor. The PSDL editor must be launched from the main program. The entire program is written in Java, and is platform independent. It can be executed on any machine or operating system where a Jdk1.2 compatible Java runtime environment can be found. As Java does not allow global variables, each class has its own fields and methods that is written in an object-oriented way.

Figure 7 shows the data flow between the major modules of the program. The main program invokes the PSDLBuilder, which reads the prototype from file and constructs the data structure. The main program provides the prototype data structures to the PSDL Editor. The data flow diagrams are constructed by the PSDL Editor routines. PSDL Parser validates user inputs during the modification of the prototype. CreatePsdl routine maps the data structures to PSDL and saves the prototype to disk.

B. DATA STRUCTURES

The PSDL Editor maintains two kinds of data structures. One of these data structures is a tree that represents the prototype components as nodes in the tree. If an operator is composite, operators corresponding to the vertices in its data flow diagram implementation are represented as its children nodes. If the component is an atomic operator or a stream, then it is a leaf node in the tree hierarchy.

The other data structure is a vector that holds display components as its components. These display components are the current operator's children components. As the user navigates through the prototype, this vector is updated continuously to hold the children of the current operator. The data structures and their hierarchy are shown in Figure 8.

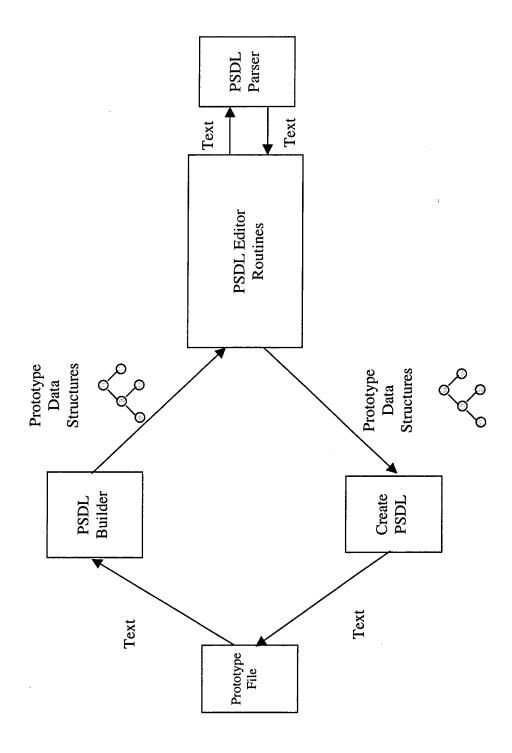


Figure 7. Data Flow Between Major Modules

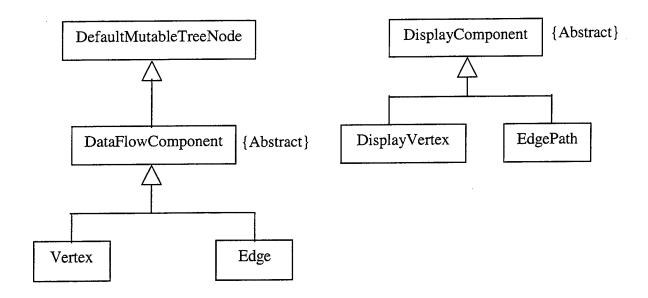


Figure 8. DataFlowComponents and DisplayComponents Hierarchy

1. Data Flow Components

A DataFlowComponent is the parent class of an Edge and a Vertex. The common fields of Vertex and Edge are abstracted in the DataFlowComponent. DataFlowComponent itself is implemented as a subclass of DefaultMutableTreeNode.

2. Display Components

DisplayComponents objects are used to represent Data Flow Diagram Components visually on the drawing panel. DisplayComponent is an abstract class and contains the common fields and methods of the DisplayVertex and EdgePath classes.

DisplayVertex class has a Vertex field. It does not contain any information about the PSDL components. To view a Vertex on the drawing panel, it queries necessary fields from its associated Vertex field. These are values such as x and y locations of the component, color of the component, etc. The shape field of DisplayVertex holds either a rectangle object or a circle object according to the type of the Vertex.

EdgePath class is implemented similar to the DisplayVertex class. Its shape object is implemented as a GeneralPath object from the java.awt.geom package. It also queries values

from its associated Edge object to display the component on the drawing panel.

C. PSDL MAPPING

The mapping of PSDL from and to the Editor is implemented in the same way as CAPS Release 2.0. Chapter 4 of Reference 4 describes these mappings. The focus of the Editor is again on the current operator. All modifications are performed on the current operator except the global data types and the properties windows for the child operators and streams.

PsdlBuilder package is responsible for mapping PSDL to the Graph Editor data structures. CAPS Release 2.0 maintained two copies of the data structures, one for the Graph Editor and one for the Background Checker. This redundancy crippled the performance of the program. This implementation maintains one copy of these data structures throughout the program. This improves the performance as no synchronization is necessary for the redundant copy.

CreatePsdl class maps the PSDL Editor data structures to PSDL. It starts from the root operator and visits all the children and sub-children. While visiting an operator, it extracts the fields of the operator and creates PSDL code.

D. SYNTACTIC VALIDATIONS

The prototype is first validated by the PsdlBuilder while it is read from file. An error message will appear if a syntactic error is found in the PSDL file. The program will stop at this point. Thus, the PSDL Editor cannot modify or view a corrupted prototype file. As the PsdlBuilder successfully parses the prototype file, it constructs the data structures as well.

A second type of validation is performed when the PSDL code is created by the CreatePsdl routine. The PsdlParser is invoked with the created PSDL code. If the parsing of the code is successful, the prototype is saved in the file. If it is not, an error message is displayed.

The third type of syntactic validations takes place during the modifications of the operators and streams in the PSDL Editor. Each user input is validated by invoking the PsdlParser routines.

PsdlParser routine contains only static methods. An object of this class need not be

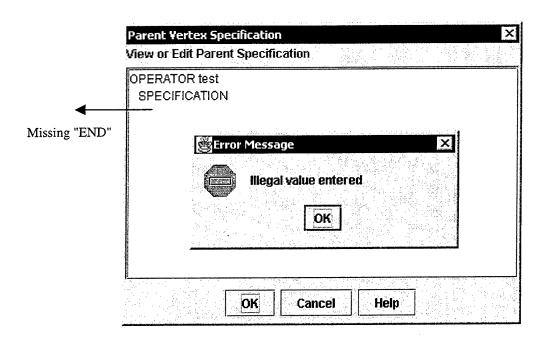


Figure 9. Syntactic Error Message

created to perform parsing. This allows partial parsing of PSDL grammar productions. GrammarCheck routine calls the necessary productions rules in PsdlParser. The input is accepted if the PsdlParser returns without throwing a ParseException. Otherwise, the user is informed that the input is not syntactically correct. Figure 9 shows an error message that is displayed when an attempt is made to acknowledge a syntactically incorrect "Parent Specification".

IV. USER INTERFACE IMPLEMENTATION

The main purpose of the PSDL Editor is to construct a PSDL prototype via a user friendly and easy to use graphical interface. The PSDL Editor of CAPS Release 2.0 managed to capture most of the PSDL constructs. Basic PSDL constructs could be directly synthesized from the Data Flow Diagram. Those Basic features of PSDL were enough for novice users to build executable prototypes. Users with more advanced knowledge of PSDL could use pop-up editors to create more complex constructs.

The graphical interface of this implementation is largely the same as CAPS Release 2.0. There are a few enhancements that make the use of the Editor easier. The Data Flow Diagram and their symbols are the same. However, manipulation of the data flow components on the diagram has changed slightly.

This implementation captures the PSDL constructs the same way as CAPS Release 2.0. Thus, users of previous versions will have no adaptation problems using this implementation.

A. PSDL EDITOR ENVIRONMENT

Almost all of the user interface components are implemented using Java Swing* components. The Swing library provides lightweight components, which execute more efficiently than the standard AWT components. Java Standard Look and Feel is used for the implementation, which gives a platform independent Look and Feel. Executing the program under Windows or Solaris will result in the same user interface. It was also possible to use Windows style or Motif style look and feel, but the main idea behind this research was to implement HSI in a platform independent way.

^{*} Java and Swing are trademarks of Sun microsystems.

1. PSDL Editor Layout

The Graph Editor layout has been changed in this implementation with a few added features. However, the functionality of the Editor is the same: to allow the user to create the specifications of an operator and its data flow implementation. It is still not possible to view or edit source language implementation (e.g. Ada or TAE) of an operator from the PSDL Editor.

The Editor consists of six main components as shown in Figure 10. These components and their functionality are explained in the following sections.

a. Main Window

This window is a JFrame object that holds the other components inside. It can not be run as a stand-alone program and must be invoked from the HSI main window by selecting the Edit-PSDL menu. To execute the PSDL Editor main window, either a new prototype must be created or a parsable prototype file must be provided. If a new prototype is created, the main window will open with an empty prototype. If an existing prototype is selected, the main window will construct the data flow diagram that it parses from the prototype file. In either case, the name of the prototype file will appear on the Title Bar as the name of the current prototype.

The main window will be initialized as an 800x600 window, and it will be placed in the middle of the screen. Thus, it is not recommended to use the editor with a resolution less than the specified size. However, it is still possible to resize the window after it is constructed.

The main window can be closed by using the 'Exit' menu item in the 'File' menu, or by clicking on the 'close window' icon () on the title bar. If the prototype has changed since the main window has opened, the program will prompt the user to save the prototype. The program will exit without saving the changes if 'no' is selected. The window closing operation can also be cancelled without changing the status of the prototype.

b. Menu Bar

The menu bar provides five pull down menus. Figure 11 depicts the menu

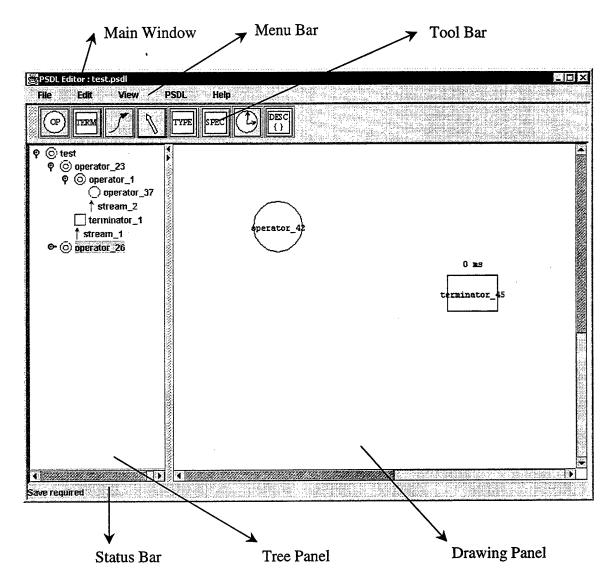


Figure 10. PSDL Editor Layout

bar and menu selection. The menus and the menu items are selected by using the left mouse button. Navigating through the menu items will also display the functionality of the menu item on the status bar.

Not all the menu items are available at the same time. If a menu item is not available for a specific situation, it will be grayed out and an attempt to use the item will have no effect. The functionality and availability of the menu items are displayed in Table 1.

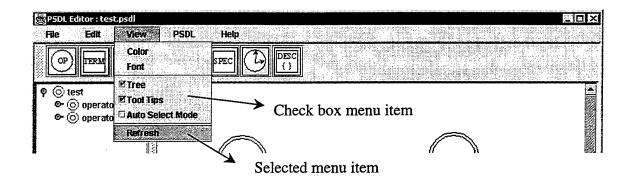


Figure 11. PSDL Editor Menu Bar and Menu Items

Some menu items are check box menu items. Selecting and deselecting the check box menu items will turn on and off the option.

c. Tool Bar

The Tool Bar is located under the Menu Bar and contains eight buttons. The first three of these buttons are used to insert data flow components into the drawing panel. An operator, a terminator or a stream will be placed into the drawing panel when the mouse is first pressed on the button, and then on the drawing panel. There are two ways that components can be placed into the drawing panel. If 'Auto Select Mode' is selected under the 'View' menu, the editor will enter into the Select mode after a component is placed. Otherwise, components will be placed into the drawing panel continuously, i.e., each time the mouse button is pressed on the drawing panel, a new component will be added to the data flow diagram.

The fourth button is used to select components from the data flow diagram. The functionalities of the remaining four buttons are described in Table 2. They open editor windows to view or modify the properties of the parent operator of the current data flow diagram. An exception to that is the Types button, which opens a text editor window to modify the properties of the global data types.

Tool Bar buttons also provide tool tips. Placing the mouse over a button will display the tool tip after two seconds. Tool tips can be enabled or disabled from the view menu.

| Menu | Identification | Functionality | Availability |
|------|----------------------|--|---|
| File | Save | Saves the current prototype to the disk | Not available if no changes are made to the prototype. |
| | Restore From Save | Ignores changes and restores the data flow diagram from the prototype file | Not available if no changes are made to the prototype |
| | Print | Prints the data flow diagram | Always |
| | Exit | Quits the PSDL Editor. Prompts for save. | Always |
| Edit | Undo | Undo for the last action. | Not available if no undoable action exists |
| | Redo | Redo for the last action. | Not available if no redoable action exists |
| | Select All | Selects all of the components currently on the draw panel. | Always |
| | Delete | Deletes the selected component | Not available if no component is selected from the draw panel |
| View | Color | Changes the current color of the draw panel | Always |
| | Font | Changes the current font of the draw panel | Always |
| | Tree | Hides or views the tree panel | Always |

Table 1. Menu Items

| Menu | Identification | Functionality | Availability |
|------|---------------------|---|---|
| View | Tool Tips | Enables or disables the tool tips for the tool bar buttons. | Always |
| | Auto Select Mode | If not checked, component insertion to the draw panel will be continuous. | Always |
| | Refresh | Refreshes the components on the draw panel | Always |
| PSDL | Go to Root | Changes the level to the root operator | Not available if the current operator is the root operator. |
| | Go to Parent | Changes the level to the parent of the current operator. | Not available if the current operator is the root operator. |
| | Decombose | Decomposes the current operator | Not available if the selected component is a stream |
| Help | PSDL Grammar | Provides help for PSDL Grammar | Always |
| | Operators | Provides help for Operators | Always |
| | Streams | Provides help for Streams | Always |
| | Exceptions | Provides help for Exceptions | Always |
| | Timers | Provides help for timers | Always |

Table 1. Menu Items

| Button | Functionality |
|---------|--|
| ОР | Draws an operator into the drawing panel |
| TERM | Draws a terminator into the drawing panel |
| | Draws a stream into the drawing panel |
| 7 | Selects a component from the drawing panel |
| ТУРЕ | Opens text editor to view or edit Data Types |
| SPEC | Opens text editor to view or edit Parent Specs |
| (D) | Opens id-list editor to view or edit Timers |
| DESC () | Opens text editor to view or edit Informal Graph Description |

Table 2. Toolbar Buttons

d. Tree Panel

One of the new features of this implementation is the Tree Panel that is placed to the left of the Drawing Panel (Refer to Figure 10). In CAPS Release 2.0, there was no global view of the PSDL prototype. The user had to traverse all intermediate nodes to modify a child operator that was five levels down. It was quite a time consuming operation when the prototype would be checked syntactically in every visited operator.

Tree Panel provides global view of the PSDL Data Flow Graph hierarchy. The root operator is placed at the top of the Tree Panel. The children of an operator are placed under their parent. Expanding a parent operator make it children visible in the Tree Panel while collapsing the parent operator will hide them.

| Component | Icon |
|----------------------|----------|
| Composite operator | 0 |
| Atomic operator | 0 |
| Composite terminator | |
| Atomic terminator | |
| Stream | ↑ |
| State stream | ↑ |

Table 3. Tree Panel Icons

Selecting a component on the Tree Panel will have different effects according to its type. If the component is a stream, it will be the same as if the select button on the toolbar is pressed and then the stream itself is selected. It does not matter which level the current data flow diagram represents, the drawing panel will automatically change its level to the selected stream's level. If the selected component is an operator or a terminator, the effect will be the same as if the component is decomposed. If the operator is already composite, the children of the operator will be visible in the drawing panel.

If the operator is atomic, a blank data flow diagram will be opened to place new components as its children.

Each component is represented on the Tree Panel by both its name and an icon specifying the type of the component. Table 3 shows the icons that are used on the Tree Panel. The Tree Panel also supports horizontal and vertical scroll bars that are automatically placed when there is not enough space to represent the components.

The Tree Panel can be hidden to provide more space for the Drawing Panel. This action can be performed either by clicking on the small triangle icons that are on the separator or by de-selecting "Tree View" menu item from the "View" menu.

e. Drawing Panel

Data Flow Components are displayed in the Drawing Panel. The size of the drawing panel is fixed to 1024x768. Changing the size of the Main Window will have no effect on the size of the Drawing Panel. Both vertical and horizontal scroll bars are provided to access the unseen areas of the Drawing Panel.

f. Status Bar

A status Bar is located in the lower part of the Main Window and provides feedback to the user. Two kinds of information are available from the status bar. According to whether or not the prototype has been modified, the status bar will display either "Save Required" or "Save Not Required".

The second kind of information is provided when the mouse is placed on a button in the tool bar or on a menu item. The functionality of the buttons and menu items are displayed as mini-help in the status bar. It is not necessary to press the buttons for the Status Bar to display their functionality.

2. Cursor Types

There are three types of cursors that are used within the PSDL Editor. Hand Cursor is used when the editor is in the select mode and the mouse is over a data flow component on the display area. Hand cursor is also displayed when the mouse is over the label of a component, or met of an operator, or latency of a stream.

Move cursor is displayed during the relocation of a component or a label on the drawing panel. It is also used when an operator is resized. For all other purposes, the arrow shaped default cursor is used.

3. Mouse Interface

The PSDL Editor assumes a two-button mouse. The right mouse button is only used to launch a pop-up menu that is used to change the properties of a component on the drawing panel. This is accomplished by placing the mouse over a component or a label (the cursor will change to hand-cursor at this point) and pressing the right-mouse button. For all other features, the left-mouse button is used.

| Menu | Menu Item | Hot Key |
|------|--------------|---------|
| File | Save | CTRL-S |
| | Print | CTRL-P |
| Edit | Undo | CTRL-Z |
| | Redo | CTRL-Y |
| | Select All | CTRL-A |
| | Delete | DEL |
| View | Refresh | CTRL-F |
| PSDL | Go to Root | CTRL-R |
| | Go to Parent | CTRL-O |
| | Decompose | CTRL-D |

Table 4. PSDL Editor Hot Keys

4. Hot Keys

Hot keys provide quick access to most of the menu item functionalities. Hot keys are also identified in the menu items. Table 4 shows the hot keys and their associated menus and menu items.

B. DATA FLOW DIAGRAM

The implementation of composite operators is displayed in the drawing panel. Objects that are used to represent the data flow diagram components are the same as those that are used in CAPS Release 2.0. The PSDL Grammar has productions to support constructing a data flow diagram from a PSDL file.

Visual modification of components on the drawing panel is available to improve readability of the diagram. They include resizing objects, moving them from one place to another and changing colors and fonts. These are explained in the following sections.

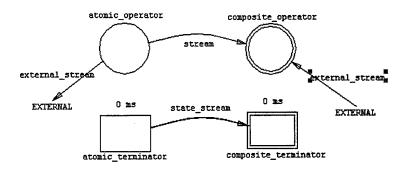


Figure 12. Data Flow Diagram Symbols

1. Data Flow Diagram Symbols

Figure 12 shows the symbols that are used to represent the data flow diagram components. Circles represent operators, rectangles represent terminators and lines represent streams.

PSDL data flow graph consists of a network of operators. An atomic operator is implemented by a supported programming language while a composite operator is implemented by a network of PSDL operators. Terminators are a special kind of operator. They represent the systems or subsystems that lie outside of the intended system. These systems or subsystems have a maximum execution time of zero since their processing time should be excluded from the total time spent on the intended system during prototype execution. Composite operators are represented by double circles and composite terminators are represented by double rectangles.

The distinction between streams and state streams is specified by using a thicker line for the state streams. The direction of data flow from source to the destination is indicated by an arrow.

Streams that enter or exit a composite operator are specified as EXTERNAL in the implementation of the operator. The source or the destination of the stream may be EXTERNAL, but not both.

2. Drawing Data Flow Components

For convenience to the users, there are two ways to draw components on the drawing panel. If the "Auto Select Mode" menu item is not checked from the "View" menu, the selected drawing tool from the tool bar will remain active until another one is selected. This provides CAPS Release 2.0-style placement of the components, as many of the selected components can be drawn without reselecting them from the Tool Bar.

In the second way, if the "Auto Select Mode" is checked, the PSDL Editor will enter into "Select Mode" as if the "Select" button from the Tool Bar is pressed after a component is drawn into the drawing panel. For successive drawings, the tools must be selected from the Tool Bar each time.

a. Operators and Terminators

The procedures to draw or modify operators and terminators are the same. From now on, we will only describe drawing operators. The same procedures can be applied to the terminators as well.

An operator is drawn by first pressing and releasing the operator button from the Tool Bar and then performing a left-click over the desired location of the operator in the drawing panel.

The PSDL Editor remembers the current font and the current color. A new operator that is drawn into the drawing panel will be drawn in the current color of the editor. Similarly, labels (including met and latency) will be specified in the current font of the editor. These properties can be changed as described later.

Inserting a new operator or a new stream will automatically update the tree panel. The name of the operator or the stream will be visible under its parent operator.

b. Streams

A stream consists of a set of control points. To draw a stream, the streams button form the Tool bar is clicked first. Control points are added with each left-click on the drawing panel. The first control point is the source of the stream. Performing a left-click when the cursor is over an operator will assign it as the source of the stream. Any number of intermediate control points can then be added to the stream's path by left clicking on the empty areas. The last control point is the destination of the stream. By

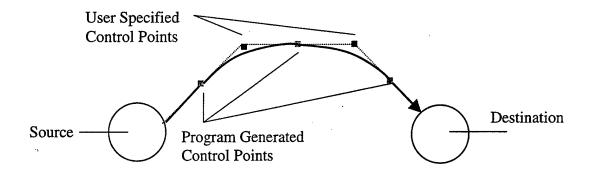


Figure 13. Construction of a stream

left-clicking over the destination operator, the drawing of the stream is complete. The stream will be drawn from the source to the destination with an arrowhead on the destination side.

Figure 13 shows how a stream is constructed. The stream is not actually drawn following the control points. Internal to the implementation, more control points are added to the path of the stream. The midpoint of two control points is added as a new control point. Insertion of the intermediate points provide a smooth curve.

For composite operators, input and output streams to the composite operators are specified as EXTERNAL in their implementation. Drawing a stream from EXTERNAL to another operator is the same except that the mouse is clicked on an empty area to specify EXTERNAL as the source. If the destination is EXTERNAL, the stream is constructed normally until the destination operator. Instead of selecting an operator as destination, the cursor is located on an empty area and right mouse button is clicked. This will draw an operator-to-EXTERNAL stream.

The insertion of a stream into the Data Flow Graph can be cancelled any time during the construction of the stream by hitting "Esc" from the keyboard. All of the intermediate control points will be deleted from the Drawing Panel.

c. Labels

Labels represent the name of the component, the maximum execution time of operators and terminators and the latency of streams. They are placed relative to the



Figure 14. Selected Label, Operator and Stream

position of the component. For operators and terminators, labels are placed relative to the center of the component. For streams, labels are placed relative to the mid-control point.

3. Modifying the Data Flow Diagram

a. Selecting Components

Data Flow Components are selected from the drawing panel when the editor is in the Select mode. This can be provided either by clicking on the select button on the tool bar or by enabling "Auto Select mode" menu item from the "View" menu. The cursor will change to the hand cursor when the mouse is over the component. For streams, this will happen when the mouse is over or near one of the control points.

Another way to select a stream is to click on the name of the stream from the tree panel. This is a more convenient method especially when the stream is in another level of decomposition. The level of the graph will be changed automatically to the level of the selected stream.

Labels are selected the same way as the operators are selected. The cursor will change to hand cursor over the label and when selected, handle points will appear around the label.

Figure 14 shows a selected operator and a selected stream. Component handles are shown as small squares to notify the user that the component is selected.

b. Relocating Components

Components can be relocated on the drawing panel to improve the readability of the graph. To accomplish this, the editor must be in the Select mode and the

component that is to be relocated must be selected by clicking on the component. Component handles will be visible at this point as shown in Figure 14.

To move operators and terminators, the user must press the left mouse button over the component and drag the component to its new location. The drawing panel is continuously updated while dragging the component. Paths of input and output streams of the relocated component are altered while the component is dragged. The intermediate control points of the streams are not changed, only the end point towards the relocated component is updated.

Streams can not be completely moved in the drawing panel since they are tied at both ends by their source and destination. But stream paths can be changed. To do this, one of the control points must be dragged to a new location. Other control points will be updated to preserve the smoothness of the path.

Moving components will also carry their labels to their new relative location. The labels themselves can also be relocated to a new offset value. To do this, move the cursor over the label (the cursor will be changed to the hand cursor), press the left mouse button and drag the label to a new location.

We provided a new functionality in this implementation that would be useful when the user wants to place a component in an area where there is not enough space. In CAPS Release 2.0, the user had to move the components one by one, which would change the look of the graph differently than its original version. With this implementation, it is possible to select all of the components in the current level and move them to a new location. This is done by choosing "Select All" menu item from the "View" menu. The handles of all the components and labels will be visible at this point. Then, by pressing left mouse button over any component or label and dragging the mouse will relocate all the components to a new location. Left clicking the mouse in an open area of the drawing panel will de-select the components.

While moving components, it is not possible to go out of the area of the drawing panel. The component will stop on the border where it is still visible and will not move further with mouse movements. It will only move again when the mouse is dragged

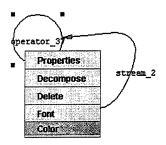


Figure 15. Component Pop-up Menu

towards the inside of the drawing panel. This functionality is also available when labels are moved by themselves. However, labels may go out of the visible area when a component is moved, causing the relative location of the label to go into the invisible area. When this happens, the user should first relocate the label to another side of the operator before moving the operator towards the border of the drawing panel.

c. Resizing Components

Only operators and terminators can be resized. The operator is selected first. Then, the mouse is placed over one of the handles and dragged to a new location.

The operator will be resized towards the direction of the dragging operation. The drawing panel is again continuously updated while resizing operators. Labels will move to a new location relative to the new center of the component. It is not possible to resize the component towards the invisible area of the drawing panel.

d. Using the Pop-up Menu

A pop-up menu will appear when the editor is in select mode and a rightclick is performed while the mouse is over a component. This pop-up menu is the same for operators and streams except that decompose and color menu items are disabled for the streams. The pop-up menu will also appear with a right click over the associated labels of the components.

Figure 15 depicts the pop-up menu that is opened for an operator. Decompose, color, font and delete menu items have the same functionality as their corresponding menu items from the menu bar as explained in Table 1.

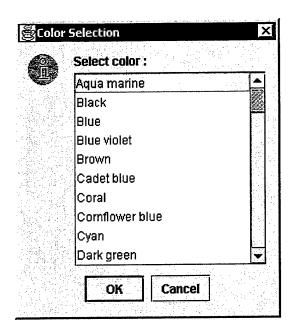


Figure 16. Color Selection Dialog

Selecting the properties menu item will launch the properties window for the component. The properties window and its functionality will be explained later in this chapter. It can also be launched by double-clicking with the left mouse button while the mouse is over a component or over the label of a component.

e. Deleting Components

Deleting procedure for operators and streams are the same. The component is selected first. It can then be deleted by using the "delete" menu item from the pop-up menu or from the "Edit" menu. It is also possible to delete the component by using the DELETE key form the keyboard. If a component is deleted from the drawing panel, it will also be deleted from the tree panel.

Deleting an operator will also delete its input and output streams. Deleting a composite operator will delete all of the sub-components of that operator.

e. Changing Colors

The fill colors of the operators can be changed to improve the readability of the diagram. This feature is not available for streams. The PSDL Editor maintains a current color value and it is initialized as the color white during startup. The value of the

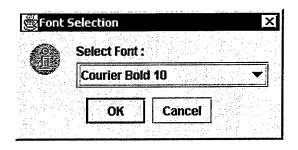


Figure 17. Font Selection Dialog

current color can be changed from the "Color" menu item which is in "View" menu. As shown in Figure 16, a dialog window will appear prompting the user to select a color value. Once a value is selected from this dialog window, it will remain as the current color until a new value is specified using the same method. All operators and terminators that are placed on the drawing panel are painted with the current color of the editor.

The color of an existing component can be changed by using the "Color" menu item from the pop-up menu. Right clicking on a component, as explained earlier, will launch the pop-up menu. The color dialog window as in Figure 16 will appear when "Color" menu item is selected. The color of the operator will be changed immediately to the color value that is selected from the dialog window. This operation is effective only for the selected component.

f. Changing Fonts

Fonts are used for the labels of the components. Changing fonts is similar to changing colors. Fonts can be specified to be the current font of the editor for future components. Again, it is possible to change the font of only the selected component. One difference is that changing fonts is also available for the streams. Figure 17 depicts the font selection dialog.

4. Navigating the Prototype

As mentioned earlier, a PSDL prototype consists of a network of operators. The PSDL Editor displays the data flow diagram of only one operator at a time. It is possible

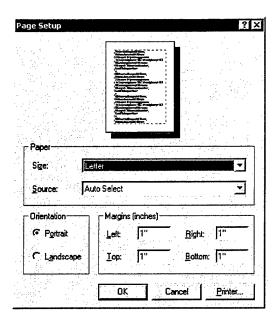


Figure 18. Print Dialog

to traverse and view the other levels of the hierarchy as well. There are four ways to navigate through the hierarchy.

The "PSDL" menu provides three menu items. "Go to Parent" and "Decompose" menu items will traverse the prototype one level up or one level down. "Go to Root" menu item is a shortcut to directly traverse to the root operator. All of these functionalities can also be invoked by Hot Keys as described in Table 4.

Another way to decompose an operator or a terminator is to use the "Decompose" menu item from the pop-up menu. The pop-up menu opens when a right-click is performed over the selected component.

The last and the most convenient way to traverse the prototype hierarchy is to use the tree panel. Selecting an operator from the tree panel will automatically decompose that operator and the children of the selected operator will be displayed in the drawing panel. If the selected operator has no children, the drawing panel will display a blank page. But, the operator will not become a composite operator until at least one component is placed as its child. If a stream is selected from the tree panel, the level will be automatically changed to the level containing the stream, and the stream handles will be displayed in the drawing panel.

5. Printing the Data Flow Diagram

Selecting the "Print" menu item from the "File" menu or using the associated Hot key will open a print dialog to select the orientation of the printout. Figure 18 shows the print dialog that opens on a Windows NT system. A similar dialog will open for other operating systems. It is possible to set the orientation to PORTRAIT or LANDSCAPE, but changing the page margins will have no effect in the printout. Each level of the prototype hierarchy is sent to the printer as a different page. At the top of the printed diagram, the name of the parent operator of that data flow diagram is also printed.

6. File Operations

PSDL Editor provides only two kinds of file operations. Selecting the "Save" menu item under the "File" menu will save the prototype to the disk. This operation is not available when the status bar displays "Save not required". The editor is sensitive to the changes that are made to the prototype. If the prototype is modified, the status of the editor will be "Save required" and this will be displayed in the status bar. The actions that cause this situation include creating new components, moving components, resizing components, deleting components and changing the properties of components.

The other kind of file operation is the "Restore from save", which resets all the changes that are made to the prototype since it was last saved. The user will be prompted that all the changes will be lost before restoring the prototype. If the user acknowledges, the last saved version will be read from the disk and its prototype will be displayed.

If the prototype is modified, an attempt to close the editor without saving the prototype will launch a warning message. The user can save and exit the program, exit the program without saving or cancel the closing operation.

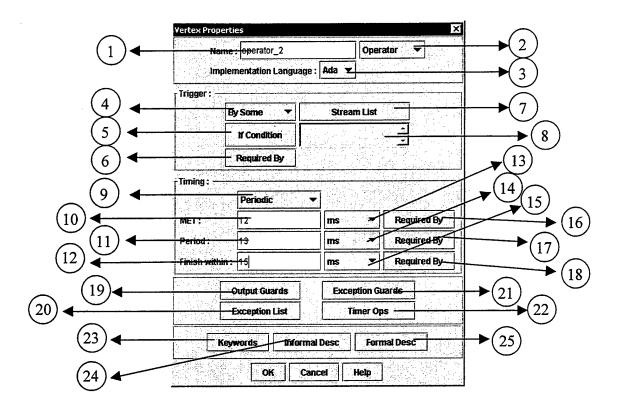


Figure 19. Operator Properties Dialog

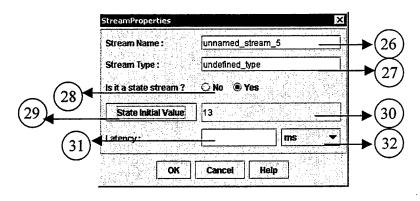


Figure 20. Stream Properties Dialog

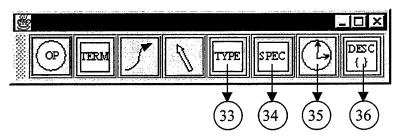


Figure 21. Tool Bar Buttons

| Window | Index | Component name | Component | Component functionality | Validation rule |
|----------|-------|---------------------------|----------------|---|-----------------|
| Operator | 1 | Operator name | Data entry | Operator name is entered into the text area | pi |
| | 2 | Operator type | Combo box | Changes an operator to terminator or vice versa | n/a |
| | 3 | Implementation language | Combo box | Changes implementation language to Ada or Tae | n/a |
| | 4 | Trigger type | Combo box | Unprotected, by some or by all | n/a |
| | 5 | Trigger if condition | Text editor | Opens text editor to edit trigger if condition | expression |
| | 9 | Trigger required by | Id-list editor | Opens id-list editor to edit trigger requirements | id_list |
| | 7 | Trigger identifier list | Id-list editor | Opens id-list editor to edit trigger streams list | id_list |
| | 8 | Trigger if condition exp. | Display only | If condition exp. is displayed in the text area | n/a |
| | 6 | Timing type | Combo box | Not-time-critical, periodic or sporadic | n/a |
| | 10 | MET Value | Data entry | MET value is entered into the text area | integer_literal |
| | 11 | Period/MCP Value | Data entry | Period or MCP value is entered into the text area | integer_literal |
| | 12 | Finish within/MRT value | Data entry | Finish within/MRT value is entered here | integer_literal |
| | 13 | MET units | Combo box | Microsec, ms, sec, min or hours | n/a |
| | 14 | Period/MCP units | Combo box | Microsec, ms, sec, min or hours | n/a |
| | 15 | Finish within/MRT units | Combo box | Microsec, ms, sec, min or hours | n/a |
| | 16 | MET required by | Id-list editor | Opens id-list editor to edit met requirements | id_list |
| | 17 | Period/MCP required by | Id-list editor | Opens id-list editor to edit period requirements | id_list |
| | 18 | Finish within/MRT req.by | Id-list editor | Opens id-list editor to edit FW-MRT requirement | id_list |

Table 5. Component Properties Dialog Functionality

| Window | Index | Component name | Component | Component functionality | Validation rule |
|----------|-------|-----------------------------|----------------|--|------------------------|
| Operator | 19 | Output guards | Text editor | Opens text editor to edit operator output guards | check_output_guards |
| | 20 | Exception list | Text editor | Opens text editor to edit operator exceptions | check_exception_list |
| | 21 | Exception guards | Text editor | Opens text editor to edit operator output guards | check_exception_guards |
| | 22 | Timer ops | Id-list editor | Opens id-list editor to edit operator timer-ops | check_timer_ops |
| | 23 | Keywords | Id-list editor | Opens id-list editor to edit operator keywords | id_list |
| | 24 | Informal description | Text editor | Opens text editor to edit operator informal desc. | check_informal_desc |
| | 25 | Formal Description | Text editor | Opens text editor to edit operator formal desc. | check_formal_desc |
| Stream | 26 | Stream name | Data entry | Stream name is entered into the text area | id_list |
| | 27 | Stream type | Data entry | Stream type is entered into the text area | type_name |
| | 28 | State stream selection | Radio button | Sets the stream type to state stream or not | n/a |
| | 29 | State stream initial value | Text editor | Opens text editor to edit state stream initial value | initial_expression |
| | 30 | State initial value display | Display only | Shows the state initial value | n/a |
| | 31 | Latency Value | Data entry | Latency value is entered into the text area | integer_literal |
| | 32 | Latency units | Combo box | Microsec, ms, sec, min or hours | n/a |
| Tool Bar | 33 | Data Types | Text editor | Opens text editor to edit data types | lþsdl |
| | 34 | Parent Specifications | Text editor | Opens text editor to edit parent specifications | check_parent_spec |
| | 35 | Timers | Id-list editor | Opens id-list editor to edit timers | id_list |
| | 36 | Graph Description | Text editor | Opens text editor to edit graph description | check_informal_desc |

Table 5. Component Properties Dialog Functionality

C. CHANGING COMPONENT PROPERTIES

It is possible to change operator and stream properties by using a dialog window. This dialog opens when the left mouse button is double clicked over a component or when the "Properties" menu item is selected from the pop-up menu. Different property dialogs are available for operators and streams. Figure 19 and Figure 20 show examples of these dialogs. Some of the operator properties can be modified using four buttons that are located in the Tool Bar. Figure 21 shows these buttons. The components of the dialogs and the Tool Bar are indexed in the figures. Refer to Table 5 for their functionalities. The following sections describe the types of components that are used to edit PSDL component properties.

1. Display Only

These are the text areas that are disabled for user input and only display data values. State initial value (index 29) is an example of the display only text areas.

2. Data Entry

Data entry areas accept user input from the keyboard. It may be necessary to click on the text area before entering data. If the data entered is longer that the provided area, it is not possible to see the whole data at once. However it is possible to scroll to the end of the text area by using the mouse or the left and right arrow keys. The entries or modifications to a data entry area will only be accepted when the user hits the "Ok" button on the window that contains the data entry area.

3. Combo Boxes and Radio Buttons

Combo boxes and radio buttons provide a selection from provided choices. Only one of the choices can be selected at a time. Combo boxes have pull down menus to select the value. Triggering type selection (Index 4) is an example of the combo boxes. State stream selection buttons (Index 28) is an example of the radio buttons.

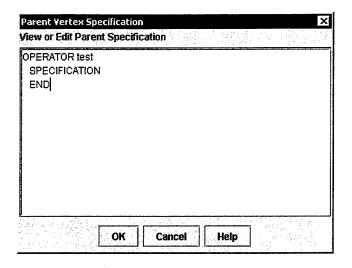


Figure 22. Text Editor

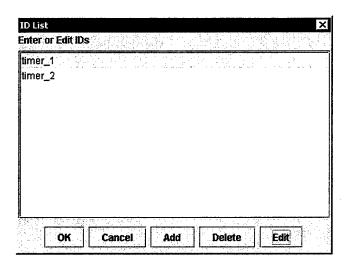


Figure 23. Id-list Editor

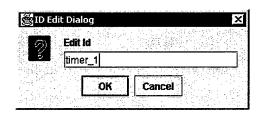


Figure 24. Id Edit Dialog

4. Text Editor

Text editor is a dialog window that is used to view or edit the properties of PSDL components. The user can scroll through the text within the editor by using the arrow keys or by positioning the mouse cursor. Figure 22 shows a text editor that displays the specification of an operator. This is launched by pressing the "Parent Specs" button on the tool bar (Index 34).

The user can make modifications in the text editor. These modifications will not be reflected to the prototype until the "OK" button is depressed. The modifications can be aborted by depressing the "CANCEL" button any time.

5. Id-list Editor

This dialog window is used to view or modify identifier lists. The modifications are not done directly by using keyboard on this editor. It views the identifiers as a list. Figure 23 shows an id-list editor that is accessed by clicking on the "Timers" button on the Tool bar (Index 35).

A new identifier can be added by pressing the "Add" button in the editor. A small dialog will open to enter a new identifier. This identifier is added to the list by pressing the "OK" button. Similarly, existing identifiers can be edited by pressing "Edit" button. A small dialog will open to edit the identifier. Figure 24 depicts the dialog that is used to edit the identifier "timer_1". If the "Edit" button is depressed when no selection is made from the id-list, a warning message will appear on the screen.

Existing identifiers can be deleted from the list by depressing the "Delete" button. Again, a warning message will be displayed when the user attempts for a delete operation without selecting an id first.

Similar to the text editor, the changes will be local to the id-list editor unless the user accepts them by depressing the "OK" button. All of the changes may be aborted by using the "Cancel" button.

V. CONCLUSION

A. RESULTS OF THIS RESEARCH

This research effort has resulted in a portable PSDL Editor for the Heterogeneous Systems Integrator. It is now possible to create PSDL prototypes on any machine and operating system where a Jdk1.2 compatible runtime environment can be found.

The performance of the program may depend on the underlying hardware that it is executed. We executed the program on a Pentium 120 MHz computer with 48 Mb RAM and on a Pentium II 400 MHz computer with 256 Mb RAM. While there was a significant difference in the performance of the two platforms, it was still possible create a prototype on the Pentium 120 MHz machine with a tolerable slowness in speed.

Basically, creating prototypes, displaying them on the user interface and modifying them are the same as CAPS Release 2.0 implementation. Users of previous CAPS versions will easily adapt to the new interface. There are some new features in this implementation, which do not affect the functionality of the program, but provide a friendlier interface and easier use.

The most powerful improvement that comes with this implementation is the addition of the Tree Panel to the Editor. The tree panel serves a few functionalities at the same time. It provides a better view of the overall prototype structure since all of the PSDL components can be seen in a hierarchy. The user can navigate through the prototype by clicking on the names of the components on the tree panel. Thus, it is possible to jump to any level in the hierarchy, which was not possible earlier.

The whole prototype is only checked syntactically when the user wants to save the prototype to the disk. In the previous implementation, some actions, such as navigating up or down through the prototype invoked a syntactic check on the prototype and then saved the prototype to the disk. If the user wanted to visit a component that was five levels down in the hierarchy, he/she had wait in all intermediate levels. These actions are removed with this implementation. Moreover, changes in one level will be propagated to the other affected levels when the user visits another level of the prototype.

The CAPS 2.0 PSDL Editor maintained two copies of the prototype data structure in the previous version. The Background Checker maintained one of the data structures while the Editor maintained the other. This was necessary, because the implementation languages of the Background Checker and the PSDL Editor were different. Synchronization of the data structures was necessary, which was degraded the performance of the program. The new implementation maintains only one copy of the data structures. The root operator is passed as an argument to the utilities such as the parser. The entire data structure can be reconstructed by getting the children of the root operator.

New features have been added to the user interface such as selecting all components, moving all components on the drawing panel, and tool tips for the buttons of the Tool Bar. These features were explained in the previous chapters.

We provided HTML documentation of the source code in Appendix C. The documentation was created automatically using Javadoc. It documents the interface of the classes (i.e., the methods and the fields of the classes) without struggling through the implementation. We also provided small definitions of the fields and the methods of the classes in the documentation. This documentation will ease the task of program understanding in future evolutions of the PSDL Editor software.

B. CRITICISMS OF THIS RESEARCH

Drawing of the components on the drawing panel is not very good. In particular, the circumference of the operators is not very smooth. Even though we used double precision classes, this problem was not solved. This problem may be due to the use of Swing components in the interface and if so, may be resolved with future releases of the Swing classes.

The PSDL Editor maintains a vector of the data flow components that are children of the current operator. While painting components on the screen, the program reads

them from this vector and draws them into the drawing panel. When a component is dragged or resized in the drawing panel, all of the components are first cleared and then repainted on the screen. This extra delay is normally not very significant. But it may get significant on a slower machine, on a busy processor or if the program is used over a network.

C. RECOMMENDATIONS

With the previous versions of CAPS and this version of HSI, the user gets a feeling as if two separate programs are executing, the main window and the PSDL Editor. In a future implementation, these two seemingly separate programs can be incorporated into one user interface. The main program would include PSDL Editor as an internal frame in itself. Even more than one editor can be launched as internal frames inside the main window. This kind of an implementation will have a more modern look and feel than it has now.

The directory structure for the prototypes of CAPS and HSI depends on environment variables. A default directory to save and open prototypes is provided in both implementations. However, it would be better in my opinion, to leave the choice of the prototype directory to the user. Like some current Integrated Development Environments, the main program could open a project file, which contains all the information such as the locations of the prototype files, the version number, etc.

We had to give up many good ideas to provide backward compatibility with CAPS Release 2.0. The current version supports 64 colors and 6 fonts for the display of the components. These colors and fonts are indexed and do not allow any expansion. The structure of PSDL grammar need not change to support more fonts and colors since an expression is sufficient to provide a color or font value (Appendix A, grammar rule 23). The color values can be saved into the prototype as the integer RGB values. Fonts can be saved as string literals. This way, CAPS and HSI programs can support more colors and fonts.

APPENDIX A. PSDL GRAMMAR*

The following is the complete specification of the Prototype System Description Language (PSDL) syntax extended Backus-Naur Form (BNF).

The BNF description of PSDL specifies the sequence of symbols, which consolidate a valid PSDL prototype. BNF describes the language in terms of production rules. Each production rule equates a non-terminal symbol to a sequence of terminal and non-terminal symbols. Terminal symbols are symbols, which can occur in PSDL. Non-terminal symbols are metalinguistic variables whose value is a sequence of symbols, which represent a PSDL construct.

Terminals are represented as **bold** symbols. Non-terminals are enclosed in angle brackets, < and >. Additional metasymbols are introduced in the extension of BNF to reduce the number of productions and non-terminals. These metasymbols are defined as:

- Square brackets, [], to enclose optional items.
- Curly braces, { } , to enclose items which may appear zero or more times.
- Vertical bars, |, to represent a choice between items.
- Parentheses, (), to represent a grouping of items.

In some cases, the metasymbols are also used as terminals within PSDL. In order to avoid confusion, such terminal symbols are enclosed within single quotes.

For ease of reference, each production rule is numbered on the left hand side. These numbers are not part of the PSDL syntax.

^{*} This appendix is taken from Reference 4, Appendix A.

```
1.
       < psdl >
            := { < component > }
2.
       < component >
            ::= < data_type >
                 < operator >
3.
       < data type >
            ::= type <id> < type_spec > < type_impl >
4.
       < type_spec >
            ::= specification [ generic < type_decl > ] [ < type_decl >
                 { operator < op_name > < operator_spec > }
                 [ < functionality > ] end
5.
       < operator >
            ::= operator < op name > < operator_spec > < operator_impl >
6
       < operator_spec >
            ::= specification { < interface > } [ < functionality > ] end
       <interface>
7.
            ::= < attribute > [ < reqmts_trace > ]
      <attribute >
8.
                generic < type_decl >
                 input < type_decl >
                 output < type_decl >
                 states < type_decl > initially < initial_expression_list >
```

```
exceptions < id_list >
                maximum execution time < time >
9.
      < type decl >
           ::= <id list>: <type_name> { , <id_list>: <type_name> }
10.
      <type name>
           ::= < id >
           | <id>'[' < type_decl>']'
      <id list>
11.
           ::= < id > { , < id > }
      < reqmts_trace >
12.
           ::= required by <id_list>
13.
      < functionality >
           ::= [ < keywords > ] [ < informal_desc > ] [ < formal_desc > ]
      <keywords >
14.
           ::= keywords < id_list >
      < informal_desc >
15.
           ::= description '{' < text > '}'
      < formal_desc >
16.
           ::= axioms '{' < text > '}'
      < type_impl >
17.
           ::= implementation < id > < id > end
```

```
implementation < type_name >
               { operator < op_name > < operator_impl > } end
18.
      < operator_impl >
               implementation <id> <id> end
          ::=
               implementation < psdl_impl > end
19.
      < psdl_impl >
          ::= < data flow diagram > [ < streams > ] [ < timers > ]
               [ < control constraints > ] [ < informal desc > ]
20.
      < data_flow_diagram >
          ::= graph { < vertex > } { < edge > }
21.
      < vertex >
          ::= vertex < op_id > [ : < time > ] { < property > }
22.
      <edge>
          23.
      < property >
          ::= property < id > = < expression >
24.
      < op_id >
          ::= [<id>.] <op_name>[ '(' [<id_list>]'|' [<id_list>]')']
25.
      < streams >
          ::= data_stream < type_decl >
```

```
26.
       < timers >
                  timer < id list >
27.
       < control constraints >
                 control constraints < constraint > { < constraint > }
28.
       < constraint >
            ::=
                 operator < op_id >
                  [ triggered [ <trigger> ] [ if <expression> ] [ <reqmts_trace> ] ]
                  [ period < time > [ < reqmts trace > ] ]
                  [ finish within < time > [ < reqmts trace > ] ]
                  [ minimum calling period < time > [ < reqmts_trace > ] ]
                  [ maximum response time < time > [ < reqmts_trace > ] ]
                  { < constraint_options > }
29.
       < constraint options >
                 output < id_list > if < expression > [ < reqmts_trace > ]
                  exception < id > [ if <expression > ] [ < reqmts_trace > ]
                  <timer op > <id> [ if < expression > ] [ < reqmts_trace > ]
30.
       < trigger >
            ::= by all < id_list >
                  by some < id_list >
31.
       < timer op >
            ::=
                 reset timer
                  start timer
                  stop timer
32.
       < initial expression list >
```

```
::= < initial_expression > { , < initial_expression > }
       < initial_expression >
33.
                true
            ::=
                false
                <integer_literal>
                < real_literal >
                < string_literal >
                < id >
                <type name > . < op_name > [ '(' < initial_expression_list> ')' ]
                '(' < initial_expression > ')'
                < initial_expression > < binary_op > < initial_expression >
                <unary_op > < initial_expression >
      <br/><br/>binary_op>
34.
           ::= and | or | xor
                < | > | = | >= | <= | /=
                + | - | & | * | / | mod | rem | **
35.
      <unary_op>
           ::= not | abs | - | +
36.
      < time >
           ::= <integer literal> < unit>
37.
      < unit >
           ::= microsec | ms | sec | min | hours
```

```
< expression_list >
38.
            ::= < expression > { , < expression > }
39.
      <expression_list >
                 true
            ::=
                 false
                 < integer_literal >
                 < time >
                 < real_literal >
                 < string literal >
                 < id >
                 <type_name > . < op_name > [ '(' < expression_list > ')']
                 '('<expression>')'
                 < expression > < binary_op > < expression >
                 <unary_op > < expression >
40.
      < op name >
            ::= < id >
41.
      < id >
            ::= < letter > { < alpha_numeric > }
      < real_literal >
42.
            ::= < integer_literal > . < integer_literal >
      <integer literal>
43.
            ::= < digit > { < digit > }
```

```
44. < string_literal >
::= " { < char > } "
```

APPENDIX B. PSDLParser and PSDLBuilder

PSDLParser and PSDLBuilder files contain JavaCC source code. JavaCC is a parser generator that is used with Java applications. It reads a grammar specification and converts it to a Java program that can recognize matches to the grammar.

JavaCC is available for download from the Internet. More information about JavaCC is available at www.suntest.com/JavaCC.

PSDLParser routines read an input stream that contains PSDL constructs. If it can successfully parse the stream, it will return without an exception. If any of the PSDL grammar constructs are violated, it will throw ParseException.

PSDLBuilder is similar to PSDLParser, but it also contains actions to create data structures to represent the prototype in PSDL Editor. These actions are embedded Java code. JavaCC automatically inserts these actions into the parser that it creates.

```
Program : PsdlGrammar.jj
Author : Ilker Duranlioglu
This grammar file is written in JavaCC version 0.8prel.
options {
   IGNORE_CASE = true;
                                                                                DEBUG_PARSER = true;
PARSER_BEGIN (PsdlParser)
package caps.Parser;
import java.io.*;
import caps.Psdl.*;
import java.util.Vector;
public class PsdlParser {
      public static void main (String args[]) throws ParseException {
} // End of the class PsdlParser
PARSER_END (PsdlParser)
 /* White Space */
SKIP :
{
       "\r"
       "\n"
/* Reserved Words */
TOKEN :
  < IF : "if" >
| < MS : "ms" >
| < SEC : "sec" >
| < END : "end" >
     < END : "end" >
< MIN : "min" >
< TYPE : "type" >
< EDGE : "edge" >
< TRUE : "true" >
      < FALSE : "false" >
< GRAPH : "graph" >
< TIMER : "timer" >
      < HOURS : "hours" >
      < INPUT : "input" >
      < INPOT : 'Input' >
< PERIOD : "period" >
< STATES : "states" >
      < AXIOMS : "axioms" > < OUTPUT : "output" >
      < OUTPUT 'output' >
    VERTEX : "vertex" >
    GENERIC : "generic" >
    MICROSEC : "microsec" >
    OPERATOR : "operator" >
    KEYWORDS : "keywords" >
}
     < KEYWORDS: "keywords" >
< FROPERTY: "property" >
< TRIGGERED: "triggered" >
< EXCEPTION: "exception" >
< INITIALLY: "initially" >
< EXCEPTIONS: "exceptions" >
< EXCEPTIONS: "exceptions" >
< DESCRIPTION: "description" >
< SPECIFICATION: "specification" >
< IMPLEMENTATION: "implementation" >
/* Operators */
TOKEN:
{
/* Binary Operators */
      8 nary Operators
< OR: "or" >
   AND: "and" >
   MOD: "mod" >
   REM: "rem" >
   XOR: "xor" >
      < AOR: "XOF" >
    GREATER_THAN: ">" >
    LESS_THAN: "<" >
    EQUALS: "=" >
    GREATER_OR_EQUAL_TO: ">=" >
     < GREATER_OR_EQUAL_TO : ">="
< LESS_OR_EQUAL_TO : "<=" >
< DIVIDE_EQUALS : "/=" >
< PLUS : "+" >
< MINUS : "-" >
< AMPERCENT : "&" >
< STAR : """ >
< FACTOR : "/" >
< STAR_STAR : "*" >
```

```
/* Unary Operators */
 | < ABS : "abs" >
| < NOT : "not" >
/* String real, and integer literals */
TOKEN :
 | < STRING_LITERAL : "\"" ( < CHAR_LIT > )* "\"" > | < #CHAR_LIT : ~[")", "\""] >
 | < REAL_LITERAL : < INTEGER_LITERAL > "." < INTEGER_LITERAL > >
 | < INTEGER_LITERAL : < INT_DIGIT > ( < INT_DIGIT > )* > | < $INT_DIGIT : ["0" - "9"] >
/* Identifiers */
TOKEN:
 /* Digits and letters */
TOKEN:
{
   < DIGIT : ["0" - "9"] > < LETTER : ["a" - "z"] | ["A" - "Z"]>
/**
 * Production 1
void psdl () :
   ( component () )*
}
  * Production 2
void component () :
{}
   data_type ()
 operator ()
  * Production 3
void data_type () :
{}
   <TYPE> id () type_spec () type_impl ()
/**
 * Production 4
/* <functionality> is directly included in this production */
void type_spec() :
()
   <sPECIFICATION> [ <GENERIC> type_decl () ] [ type_decl () ]
( <OPERATOR> op_name () operator_spec () )*
[ keywords () ] [informal_desc () ] [ formal_desc () ] <END>
  * Production 5
void operator () :
()
{
   <OPERATOR> op_name () operator_spec () operator_impl ()
  * Production 6
/* <functionality> is directly included in this production */
void operator_spec () :
{}
   <SPECIFICATION> ( inter_face () )* [ keywords () ] [informal_desc () ] [ formal_desc () ] <END>
```

```
/**
 * Production 7
void inter_face () :
   attribute () [ reqmts_trace () ]
  * Production 8
void attribute () :
()
   <GENERIC> type_decl ()
   <INPUT> type_decl ()
   <OUTPUT> type_decl ()
<STATES> type_decl () <INITIALLY> initial_expression_list ()
   <EXCEPTIONS> id_list ()
"maximum execution time" time ()
  * Production 9
void type_decl () :
   id_list () ":" type_name () ( "," id_list () ":" type_name () )*
)
/**
 * Production 10
, \slash /* This production is mofidied to remove common prefix id () */ /*
,
void type_name () :
   id ()
 | id () "[" type_decl () "]"
void type_name () :
   id () type_name_suffix ()
}
/** This production is to remove the common prefix id () */ void type_name_suffix () :
{
    *[" type_dec1 () *]*
    | empty_string ()
 * Production 11
void id_list () :
   id () ( "," id () )*
  * Production 12
void reqmts_trace () :
{}
   "required by" id_list ()
 * Production 13
/* This production is included directly in other productions,
because it caused empty string void functionality () :
   [ keywords () ] [informal_desc () ] [ formal_desc () ]
/**
 * Production 14
void keywords () :
```

```
<KEYWORDS> id_list ()
  * Production 15
void informal_desc () :
{}
    <DESCRIPTION> < TEXT >
  * Production 16
void formal_desc () :
    <AXIOMS> < TEXT >
  * Production 17
/* This production is causing a common prefix problem and is modified
void type_impl () :
{}
 <IMPLEMENTATION> id () id () <END>
| <IMPLEMENTATION> type_name ()
( <OPERATOR> op_name () operator_impl () )* <END>
void type_impl () :
    <IMPLEMENTATION> id () type_impl_suffix ()
/** This production is to remove the common prefix "implementation" */ void type_impl_suffix () :
id () <END>
    [ "[" type_name_suffix () "]" ] ( <OPERATOR> op_name () operator_impl () )* <END>
}
/**
 * Production 18
/* This production causes a common prefix problem and hence is modified void operator_impl () :
 <IMPLEMENTATION> id () id () <END>
[ <IMPLEMENTATION> psdl_impl () <END>
void operator_impl () :
()
   <IMPLEMENTATION> operator_impl_suffix ()
/** This production is to remove common prefix "implementation" */
void operator_impl_suffix () :
0
 id () id () <END>
| psdl_impl () <END>
  * Production 19
void psdl_impl () :
   data_flow_diagram () [ streams () ][ timers () ]
[ control_constraints () ] [ informal_desc () ]
  * Production 20
void data_flow_diagram () :
()
    <GRAPH> ( vertex () )* ( edge () )*
/**
 * Production 21
```

```
void vertex () :
     <VERTEX> op_id () [ ":" time () ] ( property () )*
   * Production 22
void edge () :
()
    <EDGE> id () [ ":" time () ] op_id () "->" op_id () ( property () )*
}
   * Production 23
void property () :
()
(
    <PROPERTY> id () "=" expression ()
}
  * Production 24
/* This production has common prefix problem and is modified
void op_id () :
    [ id () "." ] op_name () [ "(" [ id_list () ] " | " [ id_list () ] ")" ]
void op_id () :
()
    op_name () [ "." id () ] [ "(" [ id_list () ] "|" [ id_list () ] ")" ]
}
/**
 * Production 25
void streams () :
    "data stream" type_dec1 ()
   * Production 26
void timers () :
    <TIMER> id_list ()
  * Production 27
void control_constraints () :
    *control constraints* constraint () ( constraint () )*
/**
* Production 28
void constraint () :
{}
{
    <OPERATOR> op_id ()
[ <TRIGGERED> [ trigger () ] [ <IF> expression () ] [ reqmts_trace () ] ]
[ <PERIOD> time () [ reqmts_trace () ] ]
[ *finish within* time () [ reqmts_trace () ] ]
[ *minimum calling period* time () [ reqmts_trace () ] ]
[ *maximum response time* time () [ reqmts_trace () ] ]
( constraint_options () )*
}
  * Production 29
void constraint_options () :
 <OUTFUT> id_list () <IF> expression () [ reqmts_trace () ]
[ <EXCEPTION> id () [ <IF> expression () ] [ reqmts_trace () ]
[ timer_op () id () [ <IF> expression () ] [ reqmts_trace () ]
```

```
/**
 * Production 30
void trigger () :
{
 "by all" id_list ()
| "by some" id_list ()
  * Production 31
void timer_op () :
    "reset timer"
    "start timer"
    "stop timer"
  * Production 32
void initial_expression_list () :
    initial_expression () ( *, * initial_expression () )*
  * Production 33
/** This production has two common prefix problems and and a left recursion problem and is modified */
void initial_expression () :
 < TRUE >
| < FALSE >
   < INTEGER_LITERAL > < REAL_LITERAL >
    < STRING_LITERAL >
   id ()
   type_name () "." op_name () [ "(" initial_expression_list () ")" ] \
   "(" initial_expression () binary_op () initial_expression ()
    unary_op () initial_expression ()
void initial_expression () :
    initial_expression_1 () initial_expression_tail ()
)
void initial_expression_1 () :
   < TRUE >
  < FALSE >
  < STRING_LITERAL >
 | < INTEGER_LITERAL > initial_expression_suffix1 ()
| id () initial_expression_suffix2 ()
| "(" initial_expression () ")"
| unary_op () initial_expression ()
void initial_expression_tail () :
()
 binary_op () initial_expression () initial_expression_tail () | empty_string ()
void initial_expression_suffix1 () :
{}
 empty_string ()
[ "." < INTEGER_LITERAL >
void initial_expression_suffix2 () :
()
 empty_string ()
[ "[" type_name_suffix () "]" ] "." op_name () [ "(" initial_expression_list () ")" ]
  * Production 34
void binary_op () :
```

```
<AND> | <OR> | <XOR> | <GREATER_THAN> | <LESS_THAN>
| <EQUALS> | <GREATER_OR_EQUAL_TO> | <LESS_OR_EQUAL_TO>
| <DIVIDE_EQUALS> | <PLUS> | <MINUS> | <AMPERCENT>
| <STAR> | <FACTOR> | <MOD> | <REM> | <STAR_STAR>
/**
 * Production 35
void unary_op () :
{}
{
   <NOT> | <ABS> | <MINUS> | <PLUS>
/**
* Production 36
void time () :
0
   < INTEGER_LITERAL > unit ()
}
  * Production 37
void unit () :
()
    <MICROSEC>
   <MS>
   <MIN>
   <HOURS>
  * Production 38
void expression_list () :
   expression () ( *, * expression () )*
/** This production has two common prefix problems and and a left recursion problem and is modified */
void expression () :
()
    <TRUE>
   <FALSE>
   time ()
   < INTEGER_LITERAL > < REAL_LITERAL >
   < STRING_LITERAL > id ()
   expression () binary_op () expression () unary_op () expression ()
void expression () :
{}
   expression_1 () expression_tail ()
void expression_1 () :
()
   < TRUE >
 < INTEGER_LITERAL > expression_suffix1 ()
id () expression_suffix2 ()
'(' expression () ')'
   unary_op () expression ()
void expression_tail () :
{
 binary_op () expression () expression_tail ()
| empty_string ()
void expression_suffix1 () :
```

```
{}
 empty_string ()
| "." < INTEGER_LITERAL >
| unit ()
void expression_suffix2 () :
 '
empty_string ()
[ [ '[' type_name_suffix () ']' ] '.' op_name () [ '(' expression_list () ')' ]
/**
* Production 40
void op_name () :
   id ()
/**
    * Production 41
    */
void id () :
{}
   < IDENTIFIER >
Production 42

*/

/* This is a token, it is removed from the parser for efficiency void real_literal () :
   < INTEGER_LITERAL > "." < INTEGER_LITERAL >
 * Production 43
void integer_literal () :
{}
   < INTEGER_LITERAL >
   Production 44
*/
/* This is a token, it is removed from the parser for efficiency void string_literal () :
   < STRING_LITERAL >
Production 45

*/

/* This is a token, it is removed from the parser for efficiency
void digit () :
()
   < DIGIT >
   Production 46
*/
/* This is a token, it is removed from the parser for efficiency
void letter () :
()
   < LETTER >
/*
  Production 47
*/
/* This goes into < IDENTIFIER >, it is removed from the parser
void alpha_numeric () :
{)
   letter ()
 | digit ()
```

```
/*
    * Production 48
    */
/* This production goes into < TEXT > */
/*
void text () :
    < TEXT >
  * Production 49
/** Represents the empty string, not a part of the PSDL grammar */
void empty_string () :
()
    { return; }
}
/*
   Production 50
*/
/* This production is no more needed
void ch_ar () :
()
    < CHAR : ~["}"] >
  * This production is not in the grammar
* It is used to check output guards of a vertex
void check_output_guards () :
    ( < OUTPUT > id_list () < IF > expression () [reqmts_trace ()] )+
}
 * This production is not in the grammar
* It is used to check exception guards of a vertex
void check_exception_guards () :
()
   ( < EXCEPTION > id () [ < IF > expression () ] [reqmts_trace ()] )+
/**
 * This production is not in the grammar
 * It is used to check exception list of a vertex
void check_exception_list () :
    ( < EXCEPTIONS > id_list () )+
  * This production is not in the grammar
* It is used to check timer ops of a vertex
void check_timer_ops () :
{}
{
    ( timer_op () id () [ < IF > expression () ] [reqmts_trace ()] )+
 * This production is not in the grammar
* It is used to check parent specs
void check_parent_spec () :
   < OPERATOR > op_name () operator_spec ()
```

```
Program : PsdlBuiler.jj
   Author : Ilker Duranlioglu
   This grammar file is written in JavaCC version 0.8prel.
options {
                                          /* PSDL is not case sensitive
   IGNORE CASE = true:
                                          /* Set this flag to true to trace the parser calls */
   DEBUG_PARSER = true;
PARSER_BEGIN (PsdlBuilder)
package caps.Builder;
import java.io.*;
import java.util. *;
import caps.Psdl.*;
public class PsdlBuilder {
   private static Vector dfcVector;
   private static Vector streamsVector;
   private static Vertex currentOp;
   private static Vertex currentChild;
   private static Edge currentEdge;
   private static Vector idList = new Vector ();
   private static int index;
   public static void main (String args[]) throws ParseException {
   public static Vertex buildPrototype (File file)
       BufferedReader reader = null;
       try {
          reader = new BufferedReader (new FileReader (file));
       } catch (FileNotFoundException e) (
          System.out.println (e);
       dfcVector = new Vector ();
       streamsVector = new Vector ();
       idList = new Vector ();
       currentOp = null;
currentEdge = null;
currentChild = null;
       ReInit (reader);
       try {
      psdl ();
) catch (ParseException ex) {
          System.out.println (ex);
System.exit (0);
       Vertex root = findRoot ();
      dfcVector = null;
idList = null;
       currentOp = null;
currentEdge = null;
       currentChild = null;
       return root;
   public static String label;
   public static int id;
   public static Vertex findOperator (String name, boolean doubleSuffix)
       DataFlowComponent d;
       Vertex found = null;
extractLabel (name, doubleSuffix);
       for (Enumeration enum = dfcVector.elements (); enum.hasMoreElements ();) {
d = (DataFlowComponent) enum.nextElement ();
           String str = ""
          if (doubleSuffix)
             str = new String (d.getLabel () + "_" + d.getId () + "_" + (d.getId () - 1));
          str = new String (d.getLabel () + "_" + d.getId ());
if ((d instanceof Vertex) && (str.equals (name)))
  found = (Vertex) d;
       if (found == null) {
           if (doubleSuffix == false)
              found = new Vertex (0, 0, null, false); // This is the root
              found = new Vertex (0, 0, currentOp, false); // This is a child vertex
```

```
found.setLabel (label);
        found.setId (id):
        dfcVector.addElement (found);
    else if (doubleSuffix && found.getParent () == null) {
       currentOp.add (found);
   return found;
3
public static void extractLabel (String s, boolean doubleSuffix)
    int index = s.lastIndexOf ("_");
   int index = s.lastIndexur ('__');
String temp = s.substring (index + 1, s.length ());
int num = Integer.parseInt (temp);
s = new String (s.substring (0, index));
if (doubleSuffix == false) ( // If contains only one suffix
        label = s;
       id = num:
    else {
       index = s.lastIndexOf ("_");
       temp = s.substring (index + 1, s.length ());
num = Integer.parseInt (temp);
       s = new String (s.substring (0, index));
       label = s;
       id = num;
   )
3
public static Edge findEdge (String name)
   DataFlowComponent d;
   Edge found = null;
for (Enumeration enum = streamsVector.elements (); enum.hasMoreElements ();) {
       d = (DataFlowComponent) enum.nextElement ();
       if ((d instanceof Edge) && (d.getLabel ().equals (name)))
          found = (Edge) d;
   return found;
public static Vertex findRoot ()
   Vertex o = null:
   DataFlowComponent d;
   for (Enumeration enum = dfcVector.elements ();enum.hasMoreElements ();) {
       d = (DataFlowComponent) enum.nextElement ();
       if (d.getParent () == null)
          o = (Vertex) d;
   return o;
public static String extractIdList (Vector v)
   String str = "";
   Enumeration enum;
   if (v != null) {
       enum = v.elements ();
       if (enum.hasMoreElements ())
       str = new String ((String) enum.nextElement ());
while (enum.hasMoreElements ()) (
         str = str.concat (*, *).concat ((String) enum.nextElement ());
      }
   return str;
public static Vertex findChild (String name)
   DataFlowComponent d;
   d = (DataFlowComponent) enum.nextElement ();
if ((d instanceof Vertex) && (d.getLabel ().equals (label)))
          found = (Vertex) d;
   return found;
public static void setCurrentOp (Vertex v)
   currentOp = v;
public static void setVertexProperty (Vertex v, String prop, String exp)
   if (prop.equalsIgnoreCase ("x"))
   v.setX (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase ("y"
   v.setY (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase ('radius'))
      v.setWidth (Integer.parseInt (exp) * 2);
```

```
else if (prop.equalsIgnoreCase ("color"))
   v.setColor (Integer.parseInt (exp));
          else if (prop.equalsIgnoreCase ("label_font"))
   v.setLabelFontIndex (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase ("label_x_offset"))
          v.setLabelXOffset (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase (*label_y_offset*))
               v.setLabelYOffset (Integer.parseInt (exp));
          else if (prop.equalsIgnoreCase ("met_font"))
   v.setMetFontIndex (Integer.parseInt (exp));
          else if (prop.equalsIgnoreCase ("met_unit")) {
               if (v.getMet () != null)
                    v.getMet ().setTimeUnits (exp);
          else if (prop.equalsIgnoreCase ("met_x_offset"))
          v.setMetXOffset (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase (*met_y_offset*))
          v.setMetYOffset (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase ('is_terminator')) {
   if (exp.equalsIgnoreCase ('true'))
                    v.setTerminator (true);
         }
    )
    public static void setEdgeProperty (Edge e, String prop, String exp)
         if (prop.equalsIgnoreCase ("id"))
         ir (prop.equalsignoreCase ('lo'))
    e.setId (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase ('label_font'))
    e.setLabelFontIndex (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase ('label_x_offset'))
    e.setLabelXOffset (Integer.parseInt (exp));
          else if (prop.equalsIgnoreCase ('label_v_offset'))
   e.setLabelYOffset (Integer.parseInt (exp));
         else if (prop.equalsIgnoreCase (*latency_font*))
   e.setMetFontIndex (Integer.parseInt (exp));
          else if (prop.equalsIgnoreCase (*latency_unit*)) {
   if (e.getMet () != null)
                    e.getMet ().setTimeUnits (exp);
          else if (prop.equalsIgnoreCase ("latency_x_offset"))
         e.setMetXOffset (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase ('latency_y_offset'))
e.setMetYOffset (Integer.parseInt (exp));
else if (prop.equalsIgnoreCase ('spline'))
               e.setInitialControlPoints (exp);
} // End of the class PsdlBuilder
PARSER_END (PsdlBuilder)
/* White Space */
SKIP :
{
    "\r"
    "\E"
    •\n•
/* Reserved Words */
TOKEN :
    < IF : "if" >
    < MS : "ms" > < SEC : "sec" >
    < END : "end" > < MIN : "min" >
    < TYPE : "type" > < EDGE : "edge" >
    < TRUE : "true" > < FALSE : "false" >
     < GRAPH : "graph" >
     < TIMER : "timer" >
     < HOURS
                     "hours"
    < INPUT : "input" >
< PERIOD : "period" >
< STATES : "states" >
     < AXIOMS : "axioms"
    < OUTPUT : "output" > < VERTEX : "vertex" >
     < GENERIC : "generic" >
    < MICROSEC : "microsec" >
```

```
}
 /* Operators */
 {
/* Binary Operators */
  < MOD : "mod" >
< REM : "rem" >
< XOR : "xor" >
  < STAR_STAR : "**" >
/* Unary Operators */
| < ABS : "abs" >
| < NOT : "not" >
 /* String real, and integer literals */
TOKEN:
 | < STRING_LITERAL : "\"" ( < CHAR_LIT > )* "\"" >
| < #CHAR_LIT : -[")", "\""] >
 < REAL_LITERAL : < INTEGER_LITERAL > "." < INTEGER_LITERAL > >
 | < INTEGET_LITERAL : < INT_DIGIT > ( < INT_DIGIT > )* > | < #INT_DIGIT : [*0* - *9*] >
/* Identifiers */
 /* Digits and letters */
TOKEN:
{
  < DIGIT : ["0" - "9"] >
< LETTER : ["a" - "z"] | ["A" - "Z"]>
 * Production 1
void psdl () :
{}
   ( component () )*
  * Production 2 */
void component () :
 data_type ()
   operator ()
/**
 * Production 3
void data_type () :
{
   <TYPE> id () type_spec () type_impl ()
)
  * Production 4 */
/* <functionality> is directly included in this production */
void type_spec () :
{}
   <SPECIFICATION> [ <GENERIC> type_decl (false) ] [ type_decl (false) ]
```

```
( <OPERATOR> op_name () operator_spec () )*
[ keywords () ] [informal_desc () ] [ formal_desc () ] <END>
)
   * Production 5
void operator () :
    String name;
     <OPERATOR> name = op_name ()
     { currentOp = findOperator (name, false); }
     operator_spec () operator_impl ()
         currentOp = null;
    }
)
   * Production 6
/* <functionality> is directly included in this production */
void operator_spec () :
    String desc;
Vector list;
     <SPECIFICATION> ( inter_face () )*
     [ list = keywords () { currentOp.setKeywordList (list); } }
[ desc = informal_desc () { currentOp.setInformalDesc (desc); } ]
[ desc = formal_desc () { currentOp.setFormalDesc (desc); } ] <END>
   * Production 7
void inter_face () :
()
    attribute () /* reqmts_trace is under attribute */
}
   * Production 8
void attribute () :
    String initial:
     Token tok;
     Vector list:
     PSDLTime met;
    Vector reqmts = null;
String str;
     tok = <GENERIC> type_decl (false)
     { str = currentOp.getGenericList ();
           str = str.concat ("\n");
       str = str.concat (tok.toString () + * * + extractIdList (idList));
     [ list = reqmts_trace () { str = str.concat ("\n REQUIRED BY " + extractIdList (list)); } ]
    { currentOp.setGenericList (str); }
<INFUT> type_decl (false) [ regmts = regmts_trace () ]
    ( ((Vector) currentOp.getSpecRegats ().elementAt (0)).addElement (extractIdList (regmts)); )
<OUTPUT type_decl (false) [ regmts = regmts_trace () ]
( ((Vector) currentOp.getSpecRegmts ().elementAt (1)).addElement (extractIdList (regmts)); )
<STATES type_decl (true) <INITTALLY> initial = initial_expression_list ()
  I
         currentEdge.setStateStream (true);
currentEdge.setInitialValue (initial);
     f recomts = recomts trace () 1
    ( ((Vector) currentOp.getSpecReqmts ().elementAt (2)).addElement (extractIdList (reqmts)); }
tok = <EXCEPTIONS> list = id_list ()
     { str = currentOp.getExceptionList ();
       if (str != "")
    str = str.concat ("\n");
        str = str.concat (tok.toString () + * * + extractIdList (list));

// [ list = reqmts_trace () ( str = str.concat ("\n REQUIRED BY " + extractIdList (list)); } ]
// ( currentOp.setExceptionList (str); )
// maximum execution time" met = time () { currentOp.setMet (met); }
// [ list = reqmts_trace () { currentOp.setMetReqmts (list); } ]

   * Production 9
void type_decl (boolean buildEdge) :
Vector idList;
```

```
String type = "";
     idList = id_list () *:* type = type_name ()
         currentEdge = findEdge ((String) idList.elementAt (0));
if (buildEdge && (currentEdge == null)) {
  currentEdge = new Edge (0, 0, currentOp);
  currentEdge.setLabel ((String) idList.elementAt (0));
             streamsVector.addElement (currentEdge);
         if (buildEdge)
             currentEdge.setStreamType (type);
     ( "," idList = id_list () ":" type = type_name ()
         if (buildEdge) (
             courrentEdge = findEdge ((String) idList.elementAt (0));
for (Enumeration enum = streamsVector.elements (); enum.hasMoreElements ();) {
                 Edge e = (Edge) enum.nextElement ();
if (currentEdge.getLabel ().equals (e.getLabel ()))
                     e.setStreamType (type);
    }
)*
}
   * Production 10
 /* This production is mofidied to remove common prefix id () */
String type_name ():
    String name = "";
 name = id () { return name;}
| id () "[" type_decl (false) "]"
String type_name () :
    String name;
    name = id () type_name_suffix ()
    { return name; }
/** This production is to remove the common prefix id () */ void type_name_suffix () :
()
{
 "[" type_decl (false) "]"
| empty_string ()
  * Production 11
Vector id_list () :
    idList = new Vector ();
    String name;
   name = id () { idList.addElement (name); }
( *,* name = id () { idList.addElement (name); } )*
{return idList; }
  * Production 12
Vector reqmts_trace () :
   Vector list:
    "required by" list = id_list ()
    { return list; }
  * Production 13
/* This production is included directly in other productions, because it caused empty string
void functionality () :
{}
   [ keywords () ] [informal_desc () ] [ formal_desc () ]
```

```
/**
 * Production 14
Vector keywords ():
   Vector list;
    <KEYWORDS> list = id_list ()
   { return list; }
  * Production 15
String informal_desc () :
   Token tok;
   tok = <DESCRIPTION> text = < TEXT >
{ return new String (tok.toString () + * * + text.toString ()); }
/**
* Production 16
String formal_desc () :
   Token tok;
   Token text;
   tok = <AXIOMS> text = < TEXT >
    { return new String (tok.toString () + " " + text.toString ()); }
/**
 * Production 17
/* This production is causing a common prefix problem and is modified
void type_impl () :
0
 ( <IMPLEMENTATION> type_name ()

( <OPERATOR> op_name () operator_impl () )* <END>
void type_impl () :
   <IMPLEMENTATION> id () type_impl_suffix ()
/** This production is to remove the common prefix "implementation" */
void type_impl_suffix () :
' id () <END>
| [ *[* type_name_suffix () *]* ] ( <OPERATOR> op_name () operator_impl () )* <END>
/**
 * Production 18
/* This production causes a common prefix problem and hence is modified
void operator_impl () :
 <IMPLEMENTATION> id () id () <END>
| <IMPLEMENTATION> psdl_impl () <END>
void operator_impl () :
()
(
   <IMPLEMENTATION> operator_impl_suffix ()
/** This production is to remove common prefix "implementation" */
void operator_impl_suffix () :
   String language;
 language = id () id () <END>
  ( currentOp.setImpLanguage (language); )
| psdl_impl () <END>
```

```
}
  * Production 19
void psdl_impl () :
   String desc;
   data_flow_diagram () [ streams () ][ timers () ]
   [ control_constraints () ]
   [ desc = informal_desc () { currentOp.setGraphDesc (desc); } ]
/**
* Production 20
void data_flow_diagram () :
()
   <GRAPH> ( vertex () )* ( edge () )*
  * Production 21
void vertex () :
   String name:
   PSDLTime met;
   { currentChild = null; }
 * Production 22
void edge () :
   String name;
   PSDLTime latency;
   Vertex src;
   Vertex dest;
  <EDGE> name = id ()
{ if ((currentEdge = findEdge (name)) == null) {
           currentEdge = new Edge (0, 0, currentOp);
currentEdge.setLabel (name);
            streamsVector.addElement (currentEdge);
        else (
           if (currentEdge.getSource () == null) {
    streamsVector.removeElement (currentEdge);
               currentEdge.removeFromParent ();
           Edge e = new Edge (0, 0, currentOp);
e.setLabel (name);
           e.setLaDe1 (name);
e.setStreamType (currentEdge.getStreamType ());
e.setStateStream (currentEdge.isStateStream ());
e.setInitialValue (currentEdge.getInitialValue ());
streamSVector.addElement (e);
           currentEdge = e;
  }
[ ":" latency = time () { currentEdge.setMet (latency); } ]
  ex.addOutEdge (currentEdge);
currentEdge.setSource (ex);
                      else {
                          src = findOperator (name, true);
                          currentEdge.setSource (src);
src.addOutEdge (currentEdge);
                    )
  *->*
  currentEdge.setDestination (ex);
                      else {
                          dest = findOperator (name, true);
currentEdge.setDestination (dest);
                          dest.addInEdge (currentEdge);
                      )
  ( property (currentEdge) )*
```

```
}
  * Production 23
void property (DataFlowComponent dfc) :
   String prop;
   String exp;
   <PROPERTY> prop = id () "=" exp = expression ()
   { if (dfc instanceof Vertex)
        setVertexProperty ((Vertex) dfc, prop, exp);
        setEdgeProperty ((Edge) dfc, prop, exp);
   )
)
  * Production 24
/* This production has common prefix problem and is modified
void op_id () :
{
   [ id () "." ] op_name () [ "(" [ id_list () ] "[" [ id_list () ] ")" ]
String op_id () :
   String name:
   name = op_name () [ "." id () ] [ "(" [ id_list () ] "|" [ id_list () ] ")" ]
   { return name; }
/**
 * Production 25
void streams () :
{}
   "data stream" type_decl (true)
{ streamsVector.removeAllElements (); )
  * Production 26
void timers () :
   Vector list;
   <TIMER> list = id_list () { currentOp.setTimerList (list); }
}
  * Production 27
void control_constraints () :
   "control constraints" constraint () ( constraint () )*
  * Production 28
void constraint () :
   Vector list;
   String str;
PSDLTime t;
   <OPERATOR> str = op_id ()
{ currentChild = findChild (str); }
   [ list = reqmts_trace () { currentChild.setMcpReqmts (list); ) } ]
"maximum response time" t = time () { currentChild.setMrt (t); )
[ list = reqmts_trace () { currentChild.setMrtReqmts (list); }] ]
```

```
( constraint_options () )*
    * Production 29
 void constraint_options () :
      Token tok;
      Vector list:
      String expr = "";
String str = "";
      tok = <OUTFUT> list = id_list () { str = new String (tok.toString () + " " + extractIdList (list)); } tok = <IF> expr = expression () { str = new String (str + " " + tok.toString () + " " + expr); } [ list = reqmts_trace () { str = new String (str + "\n " + "REQUIRED BY " + extractIdList (list)); }] { currentChild.setOutputGuardList (str); }
  tok = <EXCEPTION> expr = id () { str = new String (tok.toString () + " " + expr); }
[ tok = <EXCEPTION> expr = id () { str = new String (str + " " + tok.toString () + " " + expr); }
[ tok = <IF> expr = expression () { str = new String (str + " " + tok.toString () + " " + expr); } ]
[ list = reqmts_trace () { str = new String (str + "\n " + "REQUIRED BY " + extractIdList (list)); } ]
[ currentChild.setExceptionGuardList (str); }
  { totrestchird.setexecontrolled bulbs to str | str = timer_op () expr = id () ( str = new String (str + " " + expr); )
[ tok = <IF> expr = expression () { str = new String (str + " " + tok.toString () + " " + expr); } ]
[ list = reqmts_trace () { str = new String (str + "\n " + "REQUIRED BY " + extractIdList (list)); } ]
      ( currentChild.setTimerOpList (str); )
}
   * Production 30
Vector trigger () :
{
      Vector list;
     "by all" list = id_list () ( index = 2;
  return list; )
| "by some" list = id_list ()
{ index = 1;
         return list; )
   * Production 31
String timer_op () :
{}
     "reset timer" ( return new String ("RESET TIMER"); )
"start timer" ( return new String ("START TIMER"); )
"stop timer" ( return new String ("STOP TIMER"); )
   * Production 32
String initial_expression_list () :
{
    String list = **;
String expr = **;
    { return list; }
}
   * Production 33
/** This production has two common prefix problems and and a left recursion problem and is modified */
void initial_expression () :
()
    < TRUE >
    < FALSE >
    < INTEGER_LITERAL >
    < REAL_LITERAL >
     < STRING_LITERAL >
    id ()
    type_name () "." op_name () [ "(" initial_expression_list () ")" ] \
"(" initial_expression () ")"
    initial_expression () binary_op () initial_expression () unary_op () initial_expression ()
String initial_expression () :
    String str = "";
String tail = "";
```

```
str = initial_expression_1 () tail = initial_expression_tail ()
( return new String (str + tail); )
String initial_expression_1 () :
     Token tok;
      String str;
     String suffix = "";
     tok = < TRUE > { return tok.toString (); }
     tok = < FALSE > ( return tok.toString (); )
tok = < STRING_LITERAL > ( return tok.toString (); )
tok = < INTEGER_LITERAL > suffix = initial_expression_suffix1 ()
       ( return new String (tok.toString () + suffix); }
  | str = id () suffix = initial_expression_suffix2 ()
     str = id () surfix = initial_expression_surfix2
( return new String (str + suffix); )
*(' str = initial_expression () ')'
( return new String ('(' + str + ")'); )
str = unary_op () suffix = initial_expression ()
( return new String (str + suffix); )
String initial_expression_tail () :
     String str:
      String suffix1;
     String suffix2;
     str = binary_op () suffix1 = initial_expression () suffix2 = initial_expression_tail ()
{ return new String (str + suffix1 + suffix2); }
     empty_string ()
{ return ""; }
String initial_expression_suffix1 () :
     Token tok;
     empty_string ()
     { return ""; }
"." tok = < INTEGER_LITERAL >
     { return new String ("." + tok.toString ()); }
String initial_expression_suffix2 () :
     String str = "";
String s = "";
      empty_string ()
 empty_string ()
( return ":)
| [ "[" str = type_name_suffix () "]" ( str = new String ("[" + str + "]"); ) ] "." s = op_name ()
( str = str.concat (".").concat (s); )
[ "(" s = initial_expression_list () ")" ( str = new String (str + "(" + s + ")"); )]
      { return str; }
    * Production 34
String binary_op () :
     Token tok;
     tok = <AND> { return tok.toString (); }
tok = <OR> ( return tok.toString (); }
     tok = <OR> ( return tok.toString (); )
tok = <ORP> ( return tok.toString (); )
tok = <GREATER_THAN> ( return tok.toString (); )
tok = <LESS_THAN> ( return tok.toString (); )
tok = <GRUALS> ( return tok.toString (); )
tok = <GREATER_OR_EQUAL_TO> ( return tok.toString (); )
     tok = <GREATER_OR_EQUAL_TO> ( return tok.toString (); )
tok = <LESS_OR_EQUAL_TO> ( return tok.toString (); )
tok = <PIUSDE_EQUALS> ( return tok.toString (); )
tok = <HINUS> ( return tok.toString (); )
tok = <AMPRECENT> ( return tok.toString (); )
tok = <STAR> ( return tok.toString (); )
tok = <FACTOR> ( return tok.toString (); )
tok = <FACTOR> ( return tok.toString (); )
     tok = <MOD> { return tok.toString (); }
tok = <REM> { return tok.toString (); }
     tok = <STAR_STAR> { return tok.toString (); }
/**
    * Production 35
    */
```

```
String unary_op () :
    Token tok;
    tok = <NOT> { return tok.toString (); }
tok = <ABS> { return tok.toString (); }
tok = <MINUS> { return tok.toString (); }
  tok = <PLUS> { return tok.toString (); }
/**
 * Production 36
PSDLTime time () :
    PSDLTime t = new PSDLTime ();
String str = "";
Token tok;
    tok = < INTEGER_LITERAL > ( t.setTimeValue (Integer.parseInt (tok.toString ())); )
    str = unit () ( t.setTimeUnits (str); )
( return t; )
  * Production 37
String unit () :
   Token tok:
   tok = <MICROSEC> { return tok.toString (); }
   tok = <MS> { return tok.toString (); }
 tok = <SEC> ( return tok.toString (); )
tok = <MIN> ( return tok.toString (); )
tok = <HOURS> ( return tok.toString (); )
  * Production 38
String expression_list () :
   String expList = "";
String str = "";
   return expList;
/**
 * Production 39
/** This production has two common prefix problems and and a left recursion problem and is modified */
void expression () :
()
   <TRUE>
   <FALSE>
   time ()
   < INTEGER_LITERAL >
< REAL_LITERAL >
< STRING_LITERAL >
   id ()
   type_name () "." op_name () [ "(" expression_list () ")" ]
"(" expression () ")"
,
   expression () binary_op () expression () unary_op () expression ()
String expression () :
   String exp = "";
String expTail = "";
   exp = expression_1 () expTail = expression_tail ()
       exp = exp.concat (expTail);
       return exp;
String expression_1 () :
```

```
Token tok:
     String str = "";
String suffix = "";
     tok = < TRUE > { return tok.toString (); }
  tok = < FALSE > ( return tok.toString (); )
tok = < STRING_LITERAL > ( return tok.toString (); )
tok = < INTEGER_LITERAL > suffix = expression_suffix1 ()
  ( return new String (tok.toString () + suffix); )
| str = id () suffix = expression_suffix2 ()
 | str = td / stiffx = expression_stiffx2 ()
{ return new String (str + suffix); }
| "(" str = expression () ")"
{ /*return new String ("(" + str + ")");*/
    return new String (str); /* To accept -(15) */}
| str = unary_op () suffix = expression ()
{ return new String (str + suffix); }
String expression_tail () :
     String str = "";
String suffix1 = "";
     String suffix2 = "";
     str = binary_op () suffix1 = expression () suffix2 = expression_tail ()
{ return new String (str + suffix1 + suffix2); }
     empty_string () { return ""; }
String expression_suffix1 () :
     Token tok;
     String unit = "";
     empty_string ()
{ return ""; }
"." tok = < INTEGER_LITERAL >
{ return new String ("." + tok.toString ()); }
     unit = unit ()
     { return unit; }
String expression_suffix2 () :
     String str = **;
String s = **;
     empty_string ()
 table_string ()
{ return "*; }

[ "[" str = type_name_suffix () "]" { str = new String ("[" + str + "]"); } ] "." s = op_name {)
{ str = str.concat (".").concat (s); }

[ "(" s = expression_list () ")" { str = new String (str + "(" + s + ")"); }]
     { return str: }
   * Production 40
String op_name () :
     String name;
     name = id ()
          return name;
   * Production 41
String id () :
     Token tok:
     tok = < IDENTIFIER >
         return tok.toString ();
}
   Production 42
/* This is a token, it is removed from the parser for efficiency
void real_literal () :
{}
```

```
< INTEGER_LITERAL > "." < INTEGER_LITERAL >
/**
* Production 43
String integer_literal () :
    Token intLiteral;
    intLiteral = < INTEGER_LITERAL >
       return intLiteral.toString ();
/*
   Production 44
*/
/* This is a token, it is removed from the parser for efficiency void string_literal () :
{}
    < STRING_LITERAL >
}
*/
   Production 45
*/
/* This is a token, it is removed from the parser for efficiency void digit () :
    < DIGIT >
   Production 46
*/
/* This is a token, it is removed from the parser for efficiency void letter () :
   < LETTER >
   Production 47
*/
/* This goes into < IDENTIFIER >, it is removed from the parser void alpha_numeric () :
   letter ()
digit ()
"-"
/*
* Production 48
/* This production goes into < TEXT > */
/*
String text () :
   Token text;
   text = < TEXT >
      return text.toString ();
/**
* Production 49
'** Represents the empty string, not a part of the PSDL grammar */ void empty_string () :
       return;
   Production 50
```

```
*/
/* This production is no more needed
void ch_ar () :
{}
    < CHAR : ~["}"] >
  * This production is not in the grammar

* It is used to check output guards of a vertex

*/
void check_output_guards () :
    ( < OUTPUT > id_list () < IF > expression () [reqmts_trace ()] )+
/**

* This production is not in the grammar

* It is used to check exception guards of a vertex
void check_exception_guards () :
()
    ( < EXCEPTION > id () [ < IF > expression () ] [reqmts_trace ()] )+
}
  * This production is not in the grammar
* It is used to check exception list of a vertex
void check_exception_list () :
    ( < EXCEPTIONS > id_list () )+
/**

* This production is not in the grammar

* It is used to check timer ops of a vertex
void check_timer_ops () :
()
    ( timer_op () id () [ < IF > expression () ] [reqmts_trace ()] )+
```

APPENDIX C. DOCUMENTATION OF THE SOURCE CODE

all packages, 84
package caps, 84
package caps.CAPSMain, 85
package caps.Display, 85
package caps.GraphEditor, 86
package caps.Psdl, 87

caps.Caps, 87 caps.EditorDriver, 88

caps.CAPSMain.CAPSMainMenuBar, 89 caps.CAPSMain.CAPSMainWindow, 90 caps.CAPSMain.DataBasesMenu, 93 caps.CAPSMain.EditMenu, 94 caps.CAPSMain.ExecSupportMenu, 97 caps.CAPSMain.ExitCAPSMain, 98 caps.CAPSMain.HelpMenu, 100 caps.CAPSMain.PrototypeMenu, 101

caps.Display.DisplayComponent, 103 caps.Display.DisplayExternal, 107 caps.Display.DisplayVertex, 109 caps.Display.EdgePath, 112

caps.GraphEditor.ColorConstants, 115 caps.GraphEditor.DrawPanel, 116

caps.GraphEditor.EdgeProperties, 125 caps.GraphEditor.Editor, 128 caps.GraphEditor.EditorMenuBar, 132 caps.GraphEditor.ExitEditor, 133 caps.GraphEditor.FontConstants, 134 caps.GraphEditor.GE_EditMenu, 135 caps.GraphEditor.GE_FileMenu, 137 caps.GraphEditor.GE_HelpMenu, 139 caps.GraphEditor.GE_PSDLMenu, 141 caps.GraphEditor.GE_ViewMenu, 143 caps.GraphEditor.IdListEditor, 145 caps.GraphEditor.Popup, 148 caps.GraphEditor.PrintJob, 150 caps.GraphEditor.StatusBar, 152 caps.GraphEditor.TextEditor153 caps.GraphEditor.ToolBar, 156 caps.GraphEditor.TreePanel, 158 caps.GraphEditor.TreePanelRenderer,160 caps.GraphEditor.VertexProperties, 163

caps.Psdl.DataFlowComponent, 169
caps.Psdl.DataTypes, 174
caps.Psdl.Edge, 176
caps.Psdl.External, 182
caps.Psdl.PSDLTime, 183
caps.Psdl.Vertex, 186

Class Hierarchy Index Help

Package Index

- package <u>caps</u>
- package caps.CAPSMain
- package caps.Display
- package caps.GraphEditor
- package caps.Psdl

Class Hierarchy Index Help

All Packages Class Hierarchy Index

Package caps Class Index

- Caps
- EditorDriver

All Packages Class Hierarchy Index

Package caps.CAPSMain

Class Index

- CAPSMainMenuBar
- CAPSMainWindow
- <u>DatabasesMenu</u>
- EditMenu
- ExecSupportMenu
- ExitCAPSMain
- HelpMenu
- PrototypeMenu

All Packages Class Hierarchy Index

Package caps.Display Class Index

- DisplayComponent
- DisplayExternal
- DisplayVertex
- EdgePath

All Packages Class Hierarchy Index

Package caps.GraphEditor Class Index

- ColorConstants
- DrawPanel
- EdgeProperties
- Editor
- EditorMenuBar
- ExitEditor
- FontConstants
- GE EditMenu
- GE FileMenu
- GE_HelpMenu
- GE PSDLMenu
- GE ViewMenu
- IdListEditor
- Popup

- PrintJob
- StatusBar
- TextEditor
- ToolBar
- TreePanel
- TreePanelRenderer
- VertexProperties
- All Packages Class Hierarchy Index

All Packages Class Hierarchy Index

Package caps.Psdl

Class Index

- DataFlowComponent
- DataTypes
- Edge
- External
- PSDLTime
- Vertex
- All Packages Class Hierarchy Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Caps

java.lang.Object
|
+----caps.Caps

public class Caps

extends java.lang.Object

The driver program for CAPS.

Constructor Index

Caps()

Method Index

•<u>main(String[])</u>

The constructor for this class.

CONSTINCTORS

Caps

public Caps()

Methods

main

public static void main(java.lang.String args[])
The constructor for this class.

Parameters:

args[] - The command line parameters. (No command line parameter is necessary for this program.)

88

All Packages Class Hierarchy This Package Previous

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Editor Driver

public class EditorDriver

extends java.lang.Object

The driver class for the PSDL Editor. This class is intended to execute the Editor in a stand alone way for debugging purposes.

Constructor Index

•EditorDriver()

Method Index

•main(String[])

The main method for this class

CONSTructors

EditorDriver

public EditorDriver()

Methods

main

public static void main(java.lang.String args[])
The main method for this class

Parameters:

args - The command line arguments for the driver

All Packages Class Hierarchy This Package Previous

Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. CAPSMain. CAPSMainMenuBar

java.lang.Object

| |----java.awt.Container | +----java.awt.Container | +----javax.swing.JComponent | +----javax.swing.JMenuBar | caps.CAPSMain.CAPSMainMenuBar

public class CAPSMainMenuBar

extends javax.swing.JMenuBar

The menubar of the main CAPS window.

Constructor Index

CAPSMainMenuBar(CAPSMainWindow)

The constructor for this class.

CONSTructors

CAPSMainMenuBar

public CAPSMainMenuBar (CAPSMainWindow owner)

The constructor for this class.

Parameters:

owner - The parent class which has declared this menubar.

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. CAPSMain. CAPSMainWindow

public class CAPSMainWindow

extends javax.swing.JFrame

The main CAPS window.

Variable Index

openPrototypes

The Vector that holds references to the open prototypes

90

prototype

The File that contains the PSDL prototype.

Constructor Index

CAPSMainWindow()

The constructor for this class.

Method Index

editPrototype()

Opens the graphics editor to edit a prototype.

• getOpenPrototypes()

Returns the vector that holds the open prototype files.

•initialize()

Initializes the CAPS main window.

visOpenPrototypeSaved()

Checks if the status of any of the open prototypes is 'saveRequired'.

isPrototypeChanged()

Checks whether or not the current prototype file is already used by a PSDL Editor.

eremoveEditor(Editor)

Removes one element from the openPrototypes vector.

esetPrototype(File)

Sets the prototype file to the argument.

Variables

prototype

private java.io.File prototype

The File that contains the PSDL prototype.

OpenPrototypes

private static java.util. Vector openPrototypes

The Vector that holds references to the open prototypes

CONSTINCTORS

CAPSMainWindow

public CAPSMainWindow()

The constructor for this class.

Methods

• initialize

public void initialize()

Initializes the CAPS main window.

SetPrototype

public void setPrototype (java.io.File f)

Sets the prototype file to the argument.

Parameters:

f - The File that contains the PSDL prototype.

• getOpenPrototypes

public java.util.Vector getOpenPrototypes()

Returns the vector that holds the open prototype files.

Returns:

the vector that contains the open prototype files.

•editPrototype

public void editPrototype()

Opens the graphics editor to edit a prototype.

isPrototypeChanged

public boolean isPrototypeChanged()

Checks whether or not the current prototype file is already used by a PSDL Editor.

Returns:

true if one of the open prototypes is the same as the current prototype

• remove Editor

public static void remove Editor e)

Removes one element from the openPrototypes vector.

Parameters:

e - the editor that is going to be removed from the vector.

SisOpenPrototypeSaved

public boolean isOpenPrototypeSaved()

Checks if the status of any of the open prototypes is 'saveRequired'. Prompts the user to save the prototype.

Returns:

true if none of the prototypes need saving.

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps.CAPSMain.DatabasesMenu

java.lang.Object
|
+----java.awt.Component
|
+----java.swing.JComponent
|
+----javax.swing.JComponent
|
+----javax.swing.AbstractButton
|
-----javax.swing.JMenuItem

caps.CAPSMain.DatabasesMenu

public class DatabasesMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

This class holds the Databases' menu items.

Variable Index

•designDBMenuItem

Initiates the 'Design Database' event

swBaseMenuItem

Initiates the 'Software Base' event

Constructor Index

DatabasesMenu()

Constructor for this class.

Method Index

•actionPerformed(ActionEvent)

Action event handler for the menu events.

Variables

•designDBMenuItem

private javax.swing.JMenuItem designDBMenuItem Initiates the Design Database'event

• swBaseMenuItem

private javax.swing.JMenuItem swBaseMenuItem
Initiates the 'Software Base' event

CONSTINCTORS

DatabasesMenu

public DatabasesMenu()

Constructor for this class.

Methods

PactionPerformed

public void actionPerformed (java.awt.event.ActionEvent e)
Action event handler for the menu events.

Parameters:

e - The action event that is created by selecting a menu item from this menu

All Packages Class Hierarchy This Package Previous

Class caps. CAPSMain. EditMenu

java.lang.Object

+---java.awt.Component

+---java.swing.JComponent

+---javax.swing.JComponent

+---javax.swing.AbstractButton

Previous

This Package

Class Hierarchy

All Packages

public class EditMenu

caps.CAPSMain.EditMenu

javax.swing.JMenuItem

javax.swing.JMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

This class holds the Edit' menu items.

Variable Index

adaMenuItem

Initiates the 'Ada' event

capsDefaultsMenuItem

Initiates the 'CAPS Defaults' event

-changeReqMenuItem

Initiates the 'Change Request' event

•hwModelMenuItem

Initiates the 'Hardware Model' event

S •interfaceMenuItem

Initiates the Interface' event

•owner

The main window which owns this menu.

psdlMenuItem

Initiates the PSDL' event

•requirementsMenuItem

Initiates the Requirements' event

CONSTRUCTOR INDEX

EditMenu(CAPSMainWindow)

The constructor for this class.

Method Index

•actionPerformed(ActionEvent)

Action event handler for the menu events.

Variables

•psdlMenuItem

private javax.swing.JMenuItem psdlMenuItem Initiates the PSDL'event

•adaMenuItem

private javax.swing.JMenuItem adaMenuItem Initiates the 'Ada' event

• interface MenuItem

private javax.swing.JMenuItem interfaceMenuItem Initiates the Interface'event

•requirementsMenuItem

private javax.swing.JMenuItem requirementsMenuItem
Initiates the Requirements'event

changeReqMenuItem

private javax.swing.JMenuItem changeRegMenuItem Initiates the 'Change Request' event

•capsDefaultsMenuItem

private javax.swing.JMenuItem capsDefaultsMenuItem Initiates the 'CAPS Defaults' event

•hwModelMenuItem

private javax.swing.JMenuItem hwModelMenuItem Initiates the 'Hardware Model' event

Downer

protected CAPSMainWindow owner

The main window which owns this menu.

6 Constructors

EditMenu

public EditMenu(CAPSMainWindow f)

The constructor for this class.

Parameters:

f - The parent class which has declared this menubar.

Methods

actionPerformed

public void actionPerformed(java.awt.event.ActionEvent e)
Action event handler for the menu events.

Parameters:

e - The action event that is created by selecting a menu item from this menu

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. CAPSMain. ExecSupportMenu

o javax.swing.JMenu caps.CAPSMain.ExecSupportMenu

public class ExecSupportMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

This class holds the Exec Support' menu items.

Variable Index

•compileMenuItem

Initiates the 'Compile' event

executeMenuItem

Initiates the Execute' event

scheduleMenuItem

Initiates the 'Schedule' event

•translateMenuItem

Initiates the Translate' event

Constructor Index

ExecSupportMenu()

Constructor for this class.

Method Index

•actionPerformed(ActionEvent)

Action event handler for the menu events.

Variables

• translateMenuItem

private javax.swing.JMenuItem translateMenuItem Initiates the Translate'event

ScheduleMenuItem

private javax.swing.JMenuItem scheduleMenuItem Initiates the 'Schedule' event

•compileMenuItem

private javax.swing.JMenuItem compileMenuItem Initiates the 'Compile' event

executeMenuItem

private javax.swing.JMenuItem executeMenuItem Initiates the Execute' event

& Constructors

ExecSupportMenu

public ExecSupportMenu()

Constructor for this class.

Methods

• action Performed

public void actionPerformed(java.awt.event.ActionEvent e)
Action event handler for the menu events.

Parameters:

e - The action event that is created by selecting a menu item from this menu

All Packages Class Hierarchy This Package Previous Next Index

Class caps. CAPSMain. ExitCAPSMain

class ExitCAPSMain

extends java.awt.event.WindowAdapter

Closes the caps main window and exits from the program.

Variable Index

capsMain

The main program that has declared this object

Constructor Index

»ExitCAPSMain(CAPSMainWindow)

The constructor for this class.

Method Index

*windowClosing(WindowEvent)

Window event handler for the menu events.

Variables

•capsMain

CAPSMainWindow capsMain

The main program that has declared this object

Constructors

& ExitCAPSMain

public ExitCAPSMain(CAPSMainWindow caps)

The constructor for this class.

Parameters:

owner - The parent class which has declared this menubar.

Methods

• window Closing

public void windowClosing(java.awt.event.WindowEvent e)

Window event handler for the menu events.

Parameters:

e - The window event that is created when the program close icon is

pressed.

Overrides:

windowClosing in class java.awt.event.WindowAdapter

All Packages Class Hierarchy This Package Previous Next Index

Class caps. CAPSMain. HelpMenu

00 javax.swing.JMenu

caps.CAPSMain.HelpMenu

public class HelpMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

This class implements the 'Help' menu.

CONSTRUCTOR INDEX

HelpMenu()

Constructor for this class.

Method Index

•actionPerformed(ActionEvent)

Action event handler for the menu events.

CONSTRUCTORS

→ HelpMenu

public HelpMenu()

Constructor for this class.

Methods

•actionPerformed

public void actionPerformed(java.awt.event.ActionEvent e)
Action event handler for the menu events.

Parameters:

e - The action event that is created by selecting a menu item from this menu

All Packages Class Hierarchy This Package Previous

Next Index

Class caps. CAPSMain. PrototypeMenu

public class PrototypeMenu

caps. CAPSMain. PrototypeMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

This class holds the 'Prototype' menu items.

Variable Index

•commitWorkMenuItem

Initiates the 'Commit Work' event

•newMenuItem

Initiates the 'New' event

openMenuItem

Initiates the 'Open' event

ownerWindow

The main window which owns this menu.

quitMenuItem

Initiates the 'Quit' event

retrieveMenuItem

Initiates the 'Retrieve From DDB' event

Constructor Index

<u>PrototypeMenu</u>(CAPSMainWindow)

Constructor for this class.

Method Index

*actionPerformed(ActionEvent)

Action event handler for the menu events.

*processNewMenuItem()

Handles the event which is caused by selecting the 'New' menu item.

•processOpenMenuItem()

Handles the event which is caused by selecting the 'Open' menu item.

Variables

•newMenuItem

private javax.swing.JMenuItem newMenuItem Initiates the New'event

• OpenMenuItem

private javax.swing.JMenuItem openMenuItem Initiates the 'Open' event

•commit Work MenuItem

private javax.swing.JMenuItem commitWorkMenuItem
Initiates the 'Commit Work' event

•retrieve MenuItem

private javax.swing.JMenuItem retrieveMenuItem
Initiates the Retrieve From DDB'event

•quitMenuItem

private javax.swing.JMenuItem quitMenuItem Initiates the 'Quit' event

• owner Window

protected CAPSMainWindow ownerWindow

The main window which owns this menu.

CONSTructors

PrototypeMenu

public PrototypeMenu (CAPSMainWindow owner)

Constructor for this class.

Parameters:

owner - The main window which has created this menu.

Methods

actionPerformed

public void actionPerformed (java.awt.event.ActionEvent e)
Action event handler for the menu events.

Parameters:

e - The action event that is created by selecting a menu item from this menu

• processNewMenuItem

public void processNewMenuItem()

Handles the event which is caused by selecting the 'New' menu em.

• processOpenMenuItem

public void processOpenMenuItem()

Handles the event which is caused by selecting the 'Open' menu

item.

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Display. Display Component

java,lang.Object

| +----caps.Display.DisplayComponent

public abstract class DisplayComponent

extends java.lang.Object

This is an abstract super class of EdgePath and DisplayVertex.

Variable Index

•dfc

The DataFlowComponent that this object associates with.

•HANDLESIZE

The size of the Handles.

•labelShape

The shape of the label of the component.

•metShape

The shape of the met of the component.

Constructor Index

»DisplayComponent(DataFlowComponent)

The constructor is protected so it cannot be instantiated directly.

Method Index

*ContainsClickedPoint(int, int)

This abstract method is implemented in subclasses.

•delete()

This abstract method is implemented in subclasses.

drawLabelShape(Graphics2D)

104

Gets the location of the label shape and draws it into the DrawPanel.

•drawMetShape(Graphics2D)

Gets the location of the met (or latency) shape and draws it into the DrawPanel.

•getDataFlowComponent()

Returns the DataFlowComponent that is associated with this object.

•getHandles()

This abstract method is implemented in subclasses.

egetLabelShapeBounds()

Returns the bounding rectangle of the label shape.

•getMetShapeBounds()

Returns the bounding rectangle of the met (or latency) shape.

•getShape()

This abstract method is implemented in subclasses.

•getStringHandles(Rectangle2D)

Creates a vector that holds the handles of a string (met or label).

setLabelShape(Graphics2D)

Gets the label from the DataFlowComponent and creates a TextLayout shape for the label.

setMetShape(Graphics2D)

Gets the met (or latency) from the DataFlowComponent and creates a TextLayout shape for the met.

-update()

This abstract method is implemented in subclasses.

Variables

OHANDLESIZE

public static final int HANDLESIZE

The size of the Handles.

•dfc

protected DataFlowComponent dfc

The DataFlowComponent that this object associates with.

• labelShape

java.awt.font.TextLayout labelShape

The shape of the label of the component.

metShape

java.awt.font.TextLayout metShape

The shape of the met of the component.

CONSTINCTORS

DisplayComponent

protected DisplayComponent(DataFlowComponent d)

The constructor is protected so it cannot be instantiated directly. So param d the DataFlowComponent that is associated with this object.

Methods

• getShape

public abstract java.awt.Shape getShape()

This abstract method is implemented in subclasses.

• contains Clicked Point

public abstract boolean containsClickedPoint(int xLoc, int yLoc)

This abstract method is implemented in subclasses.

• getHandles

public abstract java.util.Vector getHandles()

This abstract method is implemented in subclasses.

Oupdate

public abstract void update()

This abstract method is implemented in subclasses.

Odelete

public abstract void delete()

This abstract method is implemented in subclasses.

SetLabelShape

public void setLabelShape (java.awt.Graphics2D g2D)

Gets the label from the DataFlowComponent and creates a TextLayout shape for the label.

Parameters:

g2D - the graphics context of the DrawPanel

@getLabelShapeBounds

public java.awt.geom.Rectangle2D getLabelShapeBounds()

Returns the bounding rectangle of the label shape.

Returns:

the bounding rectangle of the label shape.

•drawLabelShape

public void drawLabelShape (java.awt.Graphics2D g2D)

Gets the location of the label shape and draws it into the DrawPanel.

Parameters:

g2D - the graphics context of the DrawPanel.

• getStringHandles

public java.util.Vector
getStringHandles(java.awt.geom.Rectangle2D r2D)

Creates a vector that holds the handles of a string (met or label).

Parameters:

 r^{2D} - the bounding rectangle of the string.

Returns

returns the Vector that holds the handles.

• setMetShape

public void setMetShape (java.awt.Graphics2D g2D)

Gets the met (or latency) from the DataFlowComponent and creates a TextLayout shape for the met.

Parameters:

g2D - the graphics context of the DrawPanel

• getMetShapeBounds

public java.awt.geom.Rectangle2D getMetShapeBounds()

Returns the bounding rectangle of the met (or latency) shape.

Returns:

the bounding rectangle of the met (or latency) shape.

OdrawMetShape

public void drawMetShape (java.awt.Graphics2D g2D)

Gets the location of the met (or latency) shape and draws it into the

DrawPanel.

Parameters:

g2D - the graphics context of the DrawPanel.

@getDataFlowComponent

public DataFlowComponent getDataFlowComponent()

Returns the DataFlowComponent that is associated with this object.

Returns:

the DataFlowComponent that is associated with this object.

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Display. Display External

java.lang.Object

+----<u>caps.Display.DisplayComponent</u> | |----caps.Display.DisplayExternal

public class DisplayExternal

extends DisplayComponent

An instance of this class is created when external streams are created.

Variable Index

external

The External object that is associated with this object.

SIIabe

The shape of the External.

Constructor Index

•DisplayExternal(External)

The constructor for this class.

Method Index

containsClickedPoint(int, int)

Always returns false since the shape is not displayed in the DrawPanel.

•delete()

Deletes the external that is associated with this object.

egetHandles()

Returns the vector that contains the handles of the shape.

egetShape()

Returns the shape that represents the External.

setLocation()

Sets the location of this shape on the DrawPanel

•update()

Updates the location and the width of this shape.

Variables

• external

protected External external

The External object that is associated with this object.

Shan

protected java.awt.geom.Rectangle2D.Double shape

The shape of the External.

CONSTINCTORS

DisplayExternal

public DisplayExternal (External e)

The constructor for this class. param e the External that is associated with this object. 108

Methods

• setLocation

public void setLocation()

Sets the location of this shape on the DrawPanel

Oupdate

public void update()

Updates the location and the width of this shape.

Overrides:

update in class DisplayComponent

OcontainsClickedPoint

public boolean containsClickedPoint(int xLoc,

Always returns false since the shape is not displayed in the DrawPanel.

Parameters:

xLoc - the x location of the clicked point.

yLoc - the y location of the clicked point.

Returns:

false.

Overrides:

containsClickedPoint in class DisplayComponent

• getHandles

public java.util.Vector getHandles()

Returns the vector that contains the handles of the shape.

Returns:

an empty Vector.

Overrides:

getHandles in class DisplayComponent

• getShape

public java.awt.Shape getShape()

Returns the shape that represents the External.

Returns:

the shape that represents the External.

Overrides:

getShape in class DisplayComponent

•delete

public void delete()

Deletes the external that is associated with this object.

Overrides:

delete in class DisplayComponent

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Display. Display Vertex

java.lang.Object

| |----<u>caps.Display.DisplayComponent</u> | |----caps.Display.DisplayVertex

public class DisplayVertex

extends DisplayComponent

This class holds a shape for its associated Vertex. It can either be a rectangle for terminators or it can be a circle for the operators.

Variable Index

•shape

The shape of the Vertex.

•<u>vertex</u>

The Vertex that is associated with this object.

Constructor Index

DisplayVertex (Vertex)

The constructor for this class.

Method Index

containsClickedPoint(int, int)

Checks whether the bounding box of the shape contains the the location where the mouse is clicked.

•delete()

Deletes the vertex that is associated with this object.

o *getHandles()

Returns the vector that contains the handles of the shape.

•getInnerShape()

This method is called if the Vertex is composite.

•getPaintedShape()

Returns a shape that is slightly smaller than the shape of this object.

•getShape()

Returns the shape that represents the Vertex.

vsetLocation()

Sets the location of this shape on the DrawPanel

•setShape()

Sets the shape of this object to a circle if the associated Vertex is an operator or sets it to a rectangle if the Vertex is a Terminator

•setWidth()

Sets the width of this shape.

•update()

Updates the location and the width of this shape.

Variables

vertex

protected Vertex vertex

The Vertex that is associated with this object.

Shape

protected java.awt.geom.RectangularShape shape

The shape of the Vertex.

CONSTINCTORS

DisplayVertex

public DisplayVertex (Vertex v)

The constructor for this class, param v the Vertex that is associated with this object.

Methods

• setLocation

public void setLocation()

Sets the location of this shape on the DrawPanel

• setWidth

public void setwidth()

Sets the width of this shape.

Oupdate

public void update()

Updates the location and the width of this shape.

Overrides:

update in class DisplayComponent

Contains Clicked Point

public boolean containsClickedPoint(int xLoc,
 int yLoc)

Checks whether the bounding box of the shape contains the the location where the mouse is clicked.

Parameters:

xLoc - the x location of the clicked point.

yLoc - the y location of the clicked point.

Returns:

true if the bounding box contains the clicked point.

Overrides:

containsClickedPoint in class DisplayComponent

• get Handles

public java.util.Vector getHandles()

Returns the vector that contains the handles of the shape.

Returns:

the vector that contains the handles of the shape

Overrides:

getHandles in class DisplayComponent

• setShape

public void setShape()

Sets the shape of this object to a circle if the associated Vertex is an operator or sets it to a rectangle if the Vertex is a Terminator

• getShape

public java.awt.Shape getShape()

Returns the shape that represents the Vertex.

Returns:

the shape that represents the Vertex.

Overrides:

getShape in class DisplayComponent

• getInnerShape

public java.awt.Shape getInnerShape()

This method is called if the Vertex is composite. It calculates and returns a smaller inner shape.

ulates and All Packages
Next Index

This Package Previous

Class Hierarchy

Returns:

the inner shape for the composite Vertex.

• getPaintedShape

public java.awt.Shape getPaintedShape()

Returns a shape that is slightly smaller than the shape of this object. The shape that is returned will be painted with the color of the Vertex.

Returns:

a shape that is slightly smaller than the shape of th object.

delete

Upublic void delete()

Deletes the vertex that is associated with this object.

Overrides:

delete in class DisplayComponent

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Display. EdgePath

public class EdgePath

extends DisplayComponent

This class represents an Edge on the DrawPanel. It contains a GeneralPath shape to represent the Edge.

Variable Index

edge

The Edge that is associated with this object.

shape

The shape of the Edge.

CONSTRUCTOR INDEX

oEdgePath(Edge)

The constructor for this class.

Method Index

•buildArrowHead(Point, Point)

Creates an arrow head for the stream.

•containsClickedPoint(int, int)

Checks whether the bounding box of the shape contains the the location where the mouse is clicked.

•<u>delete()</u>

Deletes the Edge that is associated with this object.

•getHandles()

Returns the vector that contains the handles of the shape.

•getShape()

Returns the shape that represents the Edge.

•update()

Updates the shape by polling values from the associated Edge object.

Variables

edge

protected Edge edge

The Edge that is associated with this object.

•shape

protected java.awt.geom.GeneralPath shape

The shape of the Edge.

CONSTINCTORS

EdgePath

public EdgePath (Edge e)

The constructor for this class. param e the Edge that is associated with this object.

Methods

• getShape

public java.awt.Shape getShape()

Returns the shape that represents the Edge.

Returns:

the shape that represents the Edge.

Overrides:

getShape in class DisplayComponent

• contains Clicked Point

public boolean containsClickedPoint(int xLoc,
 int yLoc)

Checks whether the bounding box of the shape contains the the location where the mouse is clicked.

Parameters:

xLoc - the x location of the clicked point.

yLoc - the y location of the clicked point.

Returns:

true if the bounding box contains the clicked point.

Overrides:

containsClickedPoint in class DisplayComponent

update

public void update()

Updates the shape by polling values from the associated Edge object.

Overrides:

update in class DisplayComponent

• build Arrow Head

Creates an arrow head for the stream.

Parameters:

last - the point before the ending point of the stream.

end - the last pointof the stream.

• getHandles

public java.util.Vector getHandles()

Returns the vector that contains the handles of the shape.

Returns:

the vector that contains the handles of the shape

Overrides:

getHandles in class DisplayComponent

• delete

public void delete()

Deletes the Edge that is associated with this object.

Overrides:

delete in class DisplayComponent

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. Color Constants

java.lang.Object

+---caps.GraphEditor.ColorConstants

public class ColorConstants

extends java.lang.Object

Variable Index

COLOR NAMES

•RGB_VALUES

Constructor Index

ColorConstants()

Variables

•COLOR_NAMES

public static java.lang.String[] COLOR_NAMES

ORGB_VALUES

public static int[] RGB_VALUES

CONSTINCTORS

ColorConstants

public ColorConstants()

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. DrawPanel

caps.GraphEditor.DrawPanel

public class DrawPanel

116

extends javax.swing.JPanel

implements java.awt.event.MouseListener, java.awt.event.ActionListener

The drawpanel is the place where the prototypes are drawn on the screen.

•currentColor

•currentComponent

Current component is either an OPERATOR, or a TERMINATOR or a STREAM according to the selection from the toolbar.

•currentEdge

currentFont

*DEFAULT CURSOR

diagonalPoint

displayComponentVector

This vector holds the shapes that are drawn in the DrawPanel.

•ePropertyPanel

Variable Index

HAND CURSOR

ponnds

| •handles Vector | •parent Vertex |
|---|--|
| • <u>HEIGHT</u> The constant height of the DrawPanel | •popupMenu |
| •IS COLLECTING POINTS | •prevPoint |
| •MOVE CURSOR | •RESIZING |
| •MOVING ALL | •selectAllMode |
| •MOVING COMPONENT | •selectedComponent |
| •MOVING_LABEL | •selectionDefault |
| •MOVING_MET | • <u>selectMode</u> The value of this variable is true if the toolbar is in the select mode |
| OPERATOR | STREAM |
| The constant which specifies an operator | The constant which specifies a stream |
| • <u>parentFrame</u> | •TERMINATOR |
| The frame which has created this DrawPanel object | The constant which specifies a terminator |

• VPropertyPanel

WIDTH

The constant width of the DrawPanel

Constructor Index

<u>DrawPanel</u>(Editor, Vertex)

Constructs a new ToolBar object

Method Index

•<u>actionPerformed(ActionEvent)</u>

changeLevel(Vertex)

«clearAllComponentsFromScreen(Graphics2D)

•decombose()

•deleteSelectedComponent()

eraseHandles()

•getDiagonalPoint(Rectangle2D)

•getParentVertex()

getPreferredSize()

Sets the size of the panel to WIDTH and HEIGHT

•gotoParent()

•gotoRoot()

•isHoldingHandle(int, int)

•mouseClicked(MouseEvent)

Handles the event that occurs when a mouse button is pressed on this panel

•<u>mouseDragged</u>(MouseEvent)

Handles the event that occurs when the mouse is dragged on this panel

| • <u>mouseEntered</u> (MouseEvent) | •processTerminator(int, int) |
|--|---|
| Handles the event that occurs when the mouse enters into the panel. | Creates a new Terminator and a new TerminatorRectangle object |
| •mouseExited(MouseEvent) | •rubberBandLine(int, int) |
| Handles the event that occurs when the mouse exits the panel. | |
| •mouseMoved(MouseEvent) | • <u>selectAllComponents()</u> |
| Handles the event that occurs when the mouse is moved on this panel | |
| • <u>mousePressed(MouseEvent)</u> | •setCurrentColor(int) |
| Handles the event that occurs when a mouse button is clicked on this | |
| pailei | • <u>setCurrentComponent(int)</u> |
| •mouseReleased(MouseEvent) | Sets the currentComnonent variable to the snecified aroument |
| Handles the event that occurs when a mouse button is released on this panel | •SetCurrentFont(int) |
| •paint(Graphics) | |
| This method is called to repaint all the components when necessary. | • <u>setMenuBarItems()</u> |
| •paintComponent(DisplayComponent) | |
| Paints the component into this panel by calling the graphics2D.draw(Shape) method. | • <u>setParentVertex</u> (Vertex, Graphics2D) |
| •processOperator(int, int) | • <u>setSelectAllMode(boolean)</u> |
| Creates a new Operator and a new OperatorCircle object. | |
| •processStream(int, int, int) | •setSelectedDFC(DataFlowComponent) |

•<u>setSelectionDefault(boolean)</u>

<u>setSelectMode(boolean)</u>

Sets the select mode to true or false.

•showProperties(DisplayComponent)

Variables

• WIDTH

public static final int WIDTH

The constant width of the DrawPanel

• HEIGHT

120

public static final int HEIGHT

The constant height of the DrawPanel

*DEFAULT_CURSOR

private final java.awt.Cursor DEFAULT_CURSOR

OHAND_CURSOR

private final java.awt.Cursor HAND_CURSOR

•MOVE_CURSOR

private final java.awt.Cursor MOVE_CURSOR

OPERATOR

public static final int OPERATOR

The constant which specifies an operator

•TERMINATOR

public static final int TERMINATOR

The constant which specifies a terminator

•STREAM

public static final int STREAM

The constant which specifies a stream

• select Mode

protected boolean selectMode

The value of this variable is true if the toolbar is in the select mode

• parentFrame

protected Editor parentFrame

The frame which has created this DrawPanel object

**displayComponentVector

protected java.util.Vector displayComponentVector

This vector holds the shapes that are drawn in the DrawPanel. Each shape is redrawn in the paint method by polling them from this Vector.

handles Vector

protected java.util.Vector handlesVector

Selected Component

protected DisplayComponent selectedComponent

•MOVING_COMPONENT

protected boolean MOVING_COMPONENT

•MOVING_LABEL

protected boolean MOVING_LABEL

MOVING_MET

protected boolean MOVING_MET

•RESIZING

protected boolean RESIZING

OIS COLLECTING POINTS

protected boolean IS_COLLECTING_POINTS

•MOVING_ALL

protected boolean MOVING_ALL

diagonalPoint

protected java.awt.geom.Point2D diagonalPoint

• vPropertyPanel

protected VertexProperties vPropertyPanel

ePropertyPanel

protected EdgeProperties ePropertyPanel

parentVertex

121

protected Vertex parentVertex

•current Edge

protected EdgePath currentEdge

Selection Default

protected boolean selectionDefault

AcurrentComponent

protected int currentComponent

Current component is either an OPERATOR, or a TERMINATOR or a STREAM according to the selection from the toolbar.

popupMenu

protected Popup popupMenu

• selectAllMode

protected boolean selectallMode

• prevPoint

protected java.awt.Point prevPoint

• pounds

protected java.awt.Rectangle bounds

•currentColor

protected int currentColor

•currentFont

protected int currentFont

CONSTINCTORS

DrawPanel

public DrawPanel (Editor frame,

/ertex root)

Constructs a new ToolBar object

Parameters:

frame - The parent frame of this DrawPanel object.

Methods

• setSelectMode

public void setSelectMode (boolean mode)

Sets the select mode to true or false. The panel is generally in the select mode unless another button is pressed in the toolbar.

Parameters:

mode - true if the panel is going to be in the select mode.

• gotoRoot

public void gotoRoot()

• gotoParent

public void gotoParent()

• decombose

public void decompose()

ChangeLevel

public void changeLevel (Vertex parent)

SetParentVertex

public void **setParentVertex** (Vertex v, java.awt.Graphics2D g2D)

eraseHandles

12. public void eraseHandles()

•clearAllComponentsFromScreen

public void **clearAllComponentsFromScreen**(java.awt.Graphics2D g2D)

SetCurrentComponent

public void setCurrentComponent(int component)

Sets the currentComponent variable to the specified argument.

Parameters:

component - OPERATOR, TERMINATOR or STREAM

SetSelectedDFC

public void setSelectedDFC(DataFlowComponent dfc)

processOperator

public void processOperator (int xLoc,

int yLoc)

Creates a new Operator and a new OperatorCircle object. Calls the paintComponent () method to draw the component to this panel.

Parameters:

xLoc - The x location of the component.

yLoc - The y location of the component.

process Terminator

public void processTerminator(int xLoc,
 int yLoc)

Creates a new Terminator and a new TerminatorRectangle object. Calls the paintComponent () method to draw the component to this panel.

Parameters:

xLoc - The x location of the component.

yloc - The y location of the component.

processStream

public void processStream(int x,
 int y,
 int clicks)

• paintComponent

public void paintComponent (DisplayComponent component)

Paints the component into this panel by calling the graphics2D.draw(Shape) method.

Parameters:

component - The component to be drawn into the panel

• paint

public void paint (java.awt.Graphics g)

This method is called to repaint all the components when necessary. •mouseEntered

Parameters:

g - The graphics context of the panel

Overrides:

paint in class javax.swing.JComponent

• getPreferredSize

public java.awt.Dimension getPreferredSize()

Sets the size of the panel to WIDTH and HEIGHT

EST Returns:

Returns a new Dimension object initialized to the WIDTH and HEIGHT parameters.

Overrides:

getPreferredSize in class javax.swing.JComponent

• mousePressed

public void mousePressed(java.awt.event.MouseEvent e)

Handles the event that occurs when a mouse button is clicked on this panel

Parameters:

e - The MouseEvent that occurs.

*SetMenuBarItems

public void setMenuBarItems()

public void mouseEntered(java.awt.event.MouseEvent e)

Handles the event that occurs when the mouse enters into the panel.

Parameters:

e - The MouseEvent that occurs.

• mouse Exited

public void mouseExited(java.awt.event.MouseEvent e)

Handles the event that occurs when the mouse exits the panel.

Parameters:

e - The MouseEvent that occurs.

• mouseClicked

public void mouseClicked (java.awt.event.MouseEvent e)

Handles the event that occurs when a mouse button is pressed on this panel

Parameters:

e - The MouseEvent that occurs.

ShowProperties

public void showProperties(DisplayComponent d)

• mouseReleased

public void mouseReleased(java.awt.event.MouseEvent e)

Handles the event that occurs when a mouse button is released on

this panel

Parameters:

e - The MouseEvent that occurs.

• mouseDragged

public void mouseDragged(java.awt.event.MouseEvent e)

Handles the event that occurs when the mouse is dragged on this nanel

Parameters:

e - The MouseEvent that occurs.

• is Holding Handle

public boolean isHoldingHandle(int x,

• getDiagonalPoint

124

public java.awt.geom.Point2D
getDiagonalPoint(java.awt.geom.Rectangle2D rect)

• mouse Moved

public void mouseMoved(java.awt.event.MouseEvent e)

Handles the event that occurs when the mouse is moved on this panel

Parameters:

e - The MouseEvent that occurs.

• actionPerformed

public void actionPerformed(java.awt.event.ActionEvent e)

deleteSelectedComponent

public void deleteSelectedComponent()

@getParentVertex

public Vertex getParentVertex()

• setSelectAllMode

public void setSelectAllMode (boolean b)

SelectAllComponents

public void selectAllComponents()

*SetSelectionDefault

public void setSelectionDefault (boolean b)

*setCurrentColor

public void setCurrentColor(int colorIndex)

SetCurrentFont

public void setCurrentFont(int fontIndex)

•rubberBandLine

protected void rubberBandLine(int x, int x)

All Packages Class Hierarchy This Package Previous

•ePath

Class caps. GraphEditor. EdgeProperties

5 caps.GraphEditor.EdgeProperties

javax.swing.JDialog

public class EdgeProperties

extends javax.swing.JDialog

implements java.awt.event.ActionListener

Variable Index

cancelButton

•helpButton

•initValueButton

initValueField

• latency Field

•latencyUnitsCombo

•nameField

•noButton

okButton

parentFrame

streamTypeField

•targetEdge

yesButton

Constructor Index

«EdgeProperties(Editor)

126

Method Index

•actionPerformed(ActionEvent)

•getUnitsCombo()

•initialize()

«setEdge(Edge)

•setEdgePath(EdgePath)

*showErrorDialog(String)

Variables

•targetEdge

Edge targetEdge

•ePath

EdgePath ePath

•nameField

javax.swing.JTextField nameField

StreamTypeField

javax.swing.JTextField streamTypeField

• latency Field

javax.swing.JTextField latencyField

• initValueField

javax.swing.JTextField initvalueField

OnoButton

javax.swing.JRadioButton noButton

SyesButton

javax.swing.JRadioButton yesButton

• latency Units Combo

javax.swing.JComboBox latencyUnitsCombo

OokButton

javax.swing.JButton okButton

cancelButton

javax.swing.JButton cancelButton

•helpButton

javax.swing.JButton helpButton

• init Value Button

javax.swing.JButton initValueButton

• parentFrame

Editor parentFrame

CONSTructors

EdgeProperties

public EdgeProperties (Editor parent)

Methods

• initialize

public void initialize()

SetEdge

public void setEdge (Edge e)

SetEdgePath

public void setEdgePath (EdgePath e)

• action Performed

public void actionPerformed(java.awt.event.ActionEvent e)

ShowErrorDialog

public void showErrorDialog(java.lang.String str)

• getUnitsCombo

public javax.swing.JComboBox getUnitsCombo()

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. Editor

```
java.lang.Object
|
+----java.awt.Component
|
+----java.awt.Container
|
+----java.awt.Window
+----java.awt.Frame
|
+----java.awt.Frame
```

Caps.GraphEditor.Editor

public class **Editor**extends javax.swing.JFrame

implements java.lang.Runnable

The main frame for the Graph Editor. It constructs and drives the other features.

Variable Index

•drawPanel

The panel that the drawing operations are performed.

INITIAL HEIGHT

The initial height of the Graph Editor

•INITIAL WIDTH

The initial width of the GraphEditor

•innerSplit

Includes the treePanel and the drawPanel.

pane

The panel that includes the Drawing area and tree view

•prototypeFile

•root

saveRequired

•statusBar

*** Pending -- is it needed? *** Returns the TreePanel object in this *** Pending -- is it needed? *** Returns the toolBar object in this The initialization of the GUI takes place here isSaveRequired() savePrototype() •getTreePanel() egetStatusBar() egetSplitPane() egetToolBar() •initialize() frame frame •getRoot() •run() *** Pending -- is it needed? *** Returns the DrawPanel object in this The panel that includes the tree structure to view CONSTRUCTOR INDEX The constructor for the editor frame the main toolbar of the GraphEditor • Editor (File, Vertex, DataTypes) 5 Method Index egetPrototypeFile() egetDataTypes() •getDrawPanel() •checkSaved() •treePanel •tBar

•setSaveRequired(boolean)

Variables

panel

protected javax.swing.JPanel panel

The panel that includes the Drawing area and tree view

• innerSplit

protected javax.swing.JSplitPane innerSplit

Includes the treePanel and the drawPanel.

• treePanel

protected <u>TreePanel</u> treePanel

The panel that includes the tree structure to view

drawPanel

protected DrawPanel drawPanel

The panel that the drawing operations are performed.

•statusBar

protected StatusBar statusBar

•tBar

protected ToolBar tBar

the main toolbar of the GraphEditor

Proof

protected Vertex root

TINITIAL WIDTH

private final int INITIAL_WIDTH
The initial width of the GraphEditor

•INITIAL_HEIGHT

private final int INITIAL HEIGHT

The initial height of the Graph Editor

• types

protected DataTypes types

prototypeFile

protected java.io.File prototypeFile

SaveRequired

protected boolean saveRequired

CONSTINCTORS

Editor

The constructor for the editor frame

Methods

•run

public void run()

• initialize

public void initialize()

The initialization of the GUI takes place here

• getTreePanel

public TreePanel getTreePanel()

*** Pending -- is it needed? *** Returns the TreePanel object in this

frame

Returns:

the treePanel object in this JFrame

getDrawPanel

public DrawPanel getDrawPanel()

*** Pending -- is it needed? *** Returns the DrawPanel object in

this frame

Returns:

the drawPanel object in this JFrame

• getToolBar

public ToolBar getToolBar()

*** Pending -- is it needed? *** Returns the toolBar object in this

frame

Returns:

the toolBar object in this JFrame

OgetStatusBar

public StatusBar getStatusBar()

• getSplitPane

public javax.swing.JSplitPane getSplitPane()

• getRoot

public Vertex getRoot()

• getDataTypes

• getPrototypeFile

public java.io.File getPrototypeFile()

SetSaveRequired

public void setSaveRequired(boolean b)

SaveRequired

public boolean isSaveRequired()

OcheckSaved

public boolean checkSaved()

SavePrototype

public void savePrototype()

This Package Class Hierarchy All Packages Next Index

Previous

131

Class caps. GraphEditor. Editor MenuBar

5E1 public class EditoriMenuBar

extends javax.swing.JMenuBar

The MenuBar of the Graph Editor.

Constructor Index

«EditorMenuBar(Editor)

The constructor for this class.

CONSTINCTORS

EditorMenuBar

public EditorMenuBar (Editor parent)

The constructor for this class.

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. ExitEditor

java.lang.Object

----java.awt.event.WindowAdapter | | +----caps.GraphEditor.ExitEditor

class ExitEditor

extends java.awt.event.WindowAdapter

Closes the caps main window and exits from the program.

Variable Index

editor

Constructor Index

ExitEditor(Editor)

Method Index

•windowClosing(WindowEvent)

Window event handler for the menu events.

Variables

editor

Editor editor

Constructors

ExitEditor

public ExitEditor (Editor e)

Methods

windowClosing

public void windowClosing(java.awt.event.WindowEvent e)

Window event handler for the menu events.

Parameters:

e - The window event that is created when the program close icon is pressed.

Overrides:

 windowClosing in class java.awt.event.WindowAdapter

 All Packages
 Class Hierarchy
 This Package Previous

 Next Index
 Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. FontConstants

java.lang.Object

| +----caps.GraphEditor.FontConstants

public class FontConstants

extends java.lang.Object

Variable Index

FONT NAMES

•FONT VALUES

Constructor Index

»FontConstants()

Variables

OFONT_VALUES

public static java.lang.String[] FONT_VALUES

©FONT_NAMES

public static java.lang.String[] FONT_NAMES

CONSTructors

FontConstants

public FontConstants()

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. GE_EditMenu

public class GE_EditMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

Constructs the Edit menu of the menubar. Also handles the events associated with the Edit Menu.

Variable Index

deleteMenuItem

Initiates the Delete' event

parent

•redoMenuItem

Initiates the 'Redo' event

•selectAllMenuItem

Initiates the 'Paste' event

136 anndoMenuItem

Initiates the 'Undo' event

Constructor Index

GE EditMenu(Editor)

The constructor for the Edit menu

Method Index

actionPerformed(ActionEvent)

Handles the menu events that occur when one of the menu items is selected

Variables

•undoMenuItem

private javax.swing.JMenuItem undoMenuItem Initiates the 'Undo' event

•redoMenuItem

private javax.swing.JMenuItem redomenuItem Initiates the Redo'event

•selectAllMenuItem

private javax.swing.JMenuItem selectAllMenuItem Initiates the Paste' event

•deleteMenuItem

private javax.swing.JMenuItem deleteMenuItem Initiates the Delete'event

parent

private Editor parent

CONSTINCTORS

GE_EditMenu

public GE_EditMenu (Editor e)

The constructor for the Edit menu

• actionPerformed

public void actionPerformed (java.awt.event.ActionEvent e)

Handles the menu events that occur when one of the menu items is selected

Parameters:

e - The associated ActionEvent

This Package Previous Class Hierarchy All Packages Next Index

+----javax.swing.AbstractButton Class caps. GraphEditor. GE_FileMenu +----Javax.swing.JComponent ----java.awt.Container +----java.awt.Component javax.swing.JMenuItem javax.swing.JMenu java.lang.Object

public class GE_FileMenu

caps.GraphEditor.GE_FileMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

Constructs the File menu of the menubar. Also handles the events associated with the File Menu.

Variable Index

exitMenuItem

Initiates the Exit' event

•parent

•printMenuItem

Initiates the 'Print' event

•restoreMenuItem

Initiates the 'Restore From Save' event

•saveMenuItem

Initiates the 'Save' event

Constructor Index

GE FileMenu(Editor)

The constructor for the File menu

Method Index

•actionPerformed(ActionEvent)

Handles the menu events that occur when one of the menu items is selected

Variables

SaveMenuItem

private javax.swing.JMenuItem saveMenuItem Initiates the 'Save' event

•restoreMenuItem

private javax.swing.JMenuItem restoreMenuItem Initiates the Restore From Save'event

• printMenuItem

private javax.swing.JMenuItem printMenuItem
Initiates the Print'event

•exitMenuItem

private javax.swing.JMenuItem exitMenuItem Initiates the Exit'event

parent

private Editor parent

CONSTINCTORS

GE_FileMenu

public GE_FileMenu(Editor e)

The constructor for the File menu

Methods

•actionPerformed

public void actionPerformed(java.awt.event.ActionEvent e)

Handles the menu events that occur when one of the menu items is selected

Parameters:

e - The associated ActionEvent

All Packages Class Hierarchy This Package Previous
Next Index

Class caps. GraphEditor. GE_HelpMenu

All Packages Class Hierarchy This Package Previous Next Index

public class GE_HelpMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

Constructs the Help menu of the menubar. Also handles the events associated with the Help Menu.

Variable Index

•exceptionsMenuItem

Initiates the Exceptions' event

•operatorsMenuItem

Initiates the 'Operators' event

psdlGrammarMenuItem

Initiates the PSDL Grammar' event

•streamsMenuItem

Initiates the 'Streams' event

• timersMenuItem

Initiates the Timers' event

Constructor Index

GE HelpMenu(Editor)

The constructor for the Help menu

Method Index

eactionPerformed(ActionEvent)

Handles the menu events that occur when one of the menu items is selected

Variables

• psdlGrammar MenuItem

private javax.swing.JMenuItem psdlgrammarMenuItem Initiates the PSDL Grammar'event

• operators MenuItem

private javax.swing.JMenuItem operatorsMenuItem
Initiates the 'Operators' event

OstreamsMenuItem

private javax.swing.JMenuItem streamsMenuItem Initiates the 'Streams' event

•exceptions MenuItem

private javax.swing.JMenuItem exceptionsMenuItem Initiates the Exceptions'event

•timersMenuItem

private javax.swing.JMenuItem timersMenuItem Initiates the Timers'event

CONSTINCTORS

GE_HelpMenu

public GE_HelpMenu(Editor e)

The constructor for the Help menu

Methods

All Packages Class Hierarchy This Package Previous Next Index

• action Performed

public void actionPerformed(java.awt.event.ActionEvent e)

Handles the menu events that occur when one of the menu items is selected

Parameters:

e - The associated ActionEvent

All Packages Class Hierarchy This Package Previous Next Index

public class GE_PSDLMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

Constructs the PSDL menu of the menubar. Also handles the events associated with the PSDL Menu.

Variable Index

•decomposeMenuItem

Initiates the Decompose' event

•gotoParentMenuItem

Initiates the 'Goto Parent' event

•gotoRootMenuItem

Initiates the 'Goto Root' event

• parent

Constructor Index

GE PSDLMenu(Editor)

The constructor for the PSDL menu

Method Index

•actionPerformed(ActionEvent)

Handles the menu events that occur when one of the menu items is selected

Variables

• gotoRootMenuItem

private javax.swing.JMenuItem gotoRootMenuItem Initiates the 'Goto Root' event

• gotoParentMenuItem

private javax.swing.JMenuItem gotoParentMenuItem Initiates the 'Goto Parent' event

*decomposeMenuItem

private javax.swing.JMenuItem decomposeMenuItem
Initiates the Decompose'event

parent

private Editor parent

CONSTRUCTORS

GE_PSDLMenu

public GE_PSDLMenu (Editor e)

The constructor for the PSDL menu

Methods

PactionPerformed

public void actionPerformed(java.awt.event.ActionEvent e)

Handles the menu events that occur when one of the menu items is selected

Parameters:

e - The associated ActionEvent

Class caps. GraphEditor. GE_ViewMenu

1 8 javax.swing.JMenu caps.GraphEditor.GE_ViewMenu

public class GE_ViewMenu

extends javax.swing.JMenu

implements java.awt.event.ActionListener

Constructs the View menu of the menubar. Also handles the events associated with the View Menu.

Variable Index

•colorMenuItem

Initiates the 'Color' event

•fontMenuItem

Initiates the Font' event

•manager

•parentFrame

•refreshMenuItem

Initiates the Refresh' event

selectionModeMenuItem

toolTipsMenuItem

•treeViewMenuItem

Initiates the Tree View' event

Constructor Index

GE ViewMenu(Editor)

The constructor for the View menu

Method Index

•actionPerformed(ActionEvent)

Handles the menu events that occur when one of the menu items is selected

Variables

ecolorMenuItem

private javax.swing.JMenuItem colorMenuItem Initiates the 'Color' event

• fontMenuItem

private javax.swing.JMenuItem fontMenuItem Initiates the Font'event

OrefreshMenuItem

private javax.swing.JMenuItem refreshMenuItem

Initiates the Refresh' event

** treeViewMenuItem

private javax.swing.JCheckBoxMenuItem treeViewMenuItem Initiates the Tree View'event

OtoolTipsMenuItem

private javax.swing.JCheckBoxMenuItem toolTipsMenuItem

Selection Mode MenuItem

private javax.swing.JCheckBoxMenuItem selectionModeMenuItem

• manager

private javax.swing.ToolTipManager manager

parentFrame

private Editor parentFrame

CONSTructors

GE_ViewMenu

public GE_ViewMenu (Editor parent)

The constructor for the View menu

Methods

• action Performed

public void actionPerformed(java.awt.event.ActionEvent e)

Handles the menu events that occur when one of the menu items is selected

Parameters:

e - The associated ActionEvent

All Packages Class Hierarchy This Package Previous

Class caps. GraphEditor.IdListEditor

java.lang.Object |

+---caps.GraphEditor.IdListEditor

public class IdListEditor

implements java.awt.event.ActionListener

extends java.lang.Object

Variable Index

•addButton

<u>ecancelButton</u>

•deleteButton

•dialog

•editButton

HEIGHT

•helpButton

•inputArea

•model

•okButton

•parentFrame

promptLabel

•south

•vector

•WIDTH

Constructor Index

JdListEditor(Editor)

Method Index

•actionPerformed(ActionEvent)

146

•getIDList()

•initialize()

openDialog(Vector)

•setListElements()

showEditDialog(String)

•showErrorDialog(String)

•showInputDialog()

Variables

•dialog

private static javax.swing.JDialog dialog

South

private static javax.swing.JPanel south

• WIDTH

private static final int WIDTH

• HEIGHT

private static final int HEIGHT

•vector

protected static java.util.Vector vector

OokButton

protected static javax.swing.JButton okbutton

•cancelButton

protected static javax.swing.JButton cancelButton

helpButton

protected static javax.swing.JButton helpButton

•addButton

protected static javax.swing. JButton addButton

•deleteButton

protected static javax.swing.JButton deleteButton

•editButton

protected static javax.swing.JButton editButton

inputArea

protected static javax.swing.JList inputArea

• model

protected static javax.swing.DefaultListModel model

promptLabel

protected static javax.swing.JLabel promptlabel

• parentFrame

protected Editor parentFrame

CONSTINCTORS

IdListEditor

public IdListEditor (Editor parent)

Methods

• initialize

protected void initialize()

OppenDialog

public static void openDialog(java.util.Vector v)

DsetListElements

public static void setListElements()

• getIDList

public static java.util.Vector getIDList()

• action Performed

public void actionPerformed(java.awt.event.ActionEvent e)

ShowErrorDialog

oublic void showErrorDialog (java.lang.String str)

ShowInputDialog

public java.lang.String showInputDialog()

• show Edit Dialog

public java.lang.String showEditDialog(java.lang.String initial)

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. Popup

caps.GraphEditor.Popup

public class Popup

148

extends javax.swing.JPopupMenu

Variable Index

colorMenuItem

•decomposeMenuItem

•deleteMenuItem

•fontMenuItem

•panel

•propMenuItem

CONSTINCTOR INDEX

-Popup(DrawPanel)

Method Index

•getColorMenuItem()

•getDecomposeMenuItem()

•getDeleteMenuItem()

•getFontMenuItem()

•getPropMenuItem()

•showPopupMenu(boolean, int, int)

Variables

decomposeMenuItem

javax.swing.JMenuItem decomposeMenuItem

• font MenuItem

149

javax.swing.JMenuItem fontMenuItem

•colorMenuItem

javax.swing.JMenuItem colorMenuItem

•deleteMenuItem

javax.swing.JMenuItem deleteMenuItem

• propMenuItem

javax.swing.JMenuItem propMenuItem

panel

DrawPanel panel

CONSTructors

Popup

public Popup (DrawPanel parent)

Methods

• getDecomposeMenuItem

public javax.swing.JMenuItem getDecomposeMenuItem()

• getFontMenuItem

public javax.swing.JMenuItem getFontMenuItem()

• getColorMenuItem

public javax.swing.JMenuItem getColorMenuItem()

• getDeleteMenuItem

public javax.swing.JMenuItem getDeleteMenuItem()

• getPropMenuItem

public javax.swing.JMenuItem getPropMenuItem()

ShowPopupMenu

public void **showPopupMenu**(boolean isEdge,

int x,

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. PrintJob

java.lang.Object

| +----caps.GraphEditor.PrintJob

public class PrintJob

extends java.lang.Object

implements java.lang.Runnable, java.awt.print.Printable, java.awt.print.Pageable

Variable Index

•format

• <u>orientation</u>

•panel

printablePages

•printJob

Constructor Index

PrintJob(DrawPanel, Vertex)

Method Index

•getNumberOfPages()

•getPageFormat(int)

•getPrintable(int)

•print(DrawPanel, Vertex)

print(Graphics, PageFormat, int)

•run()

Variables

printablePages

java.util.Vector printablePages

• printJob

java.awt.print.PrinterJob printJob

• format

java.awt.print.PageFormat format

panel

DrawPanel panel

Oorientation

int orientation

151

CONSTructors

PrintJob

public **PrintJob**(<u>DrawPanel</u> p, <u>Vertex</u> root)

Methods

Grun

public void run()

• print

• print

public int print(java.awt.Graphics g,
 java.awt.print.PageFormat f,
 int pi)

getNumberOfPages

public int getNumberOfPages()

• getPageFormat

public java.awt.print.PageFormat getPageFormat(int pageIndex)

• getPrintable

public java.awt.print.Printable getPrintable(int pageIndex)

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. StatusBar

public class **StatusBar**

extends javax.swing.JLabel

implements java.awt.event.MouseListener

Variable Index

parent

Constructor Index

StatusBar(Editor)

Method Index

•mouseClicked(MouseEvent)

•mouseDragged(MouseEvent)

•mouseEntered(MouseEvent)

•mouseExited(MouseEvent)

•mousePressed(MouseEvent)

•mouseReleased(MouseEvent)

Variables

• parent

CONSTINCTORS

StatusBar

public StatusBar (Editor e)

Methods

•mouse Entered

public void mouseEntered(java.awt.event.MouseEvent e)

• mouse Exited

public void mouseExited(java.awt.event.MouseEvent e) 153

• mouseClicked

public void mouseClicked(java.awt.event.MouseEvent e)

• mousePressed

public void mousePressed(java.awt.event.MouseEvent e)

mouseDragged

public void mouseDragged(java.awt.event.MouseEvent e)

• mouseReleased

public void mouseReleased (java.awt.event. MouseEvent e)

Class Hierarchy This Package Previous All Packages Next Index

Class caps. GraphEditor. TextEditor

All Packages Class Hierarchy This Package Previous Next Index

java.lang.Object

+----caps.GraphEditor.TextEditor

public class TextEditor

extends java.lang.Object

implements java.awt.event.ActionListener

Variable Index

•allowsEmptyString

•cancelButton

•dialog

grammarKind

•HEIGHT

•helpButton

•inputArea

okButton

•parentFrame

154

South

•text

•WIDTH

CONSTINCTOR INDEX

-TextEditor(Editor)

Method Index

•actionPerformed(ActionEvent)

egetString()

•initialize()

openDialog(String, String, String, int, boolean)

•showErrorDialog(String)

Variables

• dialog

private static javax.swing.JDialog dialog

South

private static javax.swing.JPanel south

• WIDTH

private static final int WIDTH

OHEIGHT

private static final int HEIGHT

grammarKind

private static int grammarKind

OokButton

protected static javax.swing.JButton okButton

•cancelButton

protected static javax.swing.JButton cancelButton

•helpButton

protected static javax.swing.JButton helpButton

• inputArea

G protected static javax.swing.JTextArea inputArea

promptLabel

protected static javax.swing.JLabel promptlabel

• allows Empty String

static boolean allowsEmptyString

text

static java.lang.String text

•parentFrame

protected Editor parentFrame

CONSTINCTORS

TextEditor

public TextEditor (Editor parent)

Methods

• initialize

protected void initialize()

OpenDialog

• getString

public static java.lang.String getString()

• action Performed

public void actionPerformed (java.awt.event.ActionEvent e)

ShowErrorDialog

public void showErrorDialog(java.lang.String str)

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. ToolBar

public class **ToolBar**

extends javax.swing.JToolBar

implements java.awt.event.ActionListener

The main toolbar for the prototyping events. Also handles the events associated with the toolbar buttons.

Variable Index

•graphDesc

Initiates the 'Graph Desc' event

•operator

Initiates the 'Operator' event

parentFrame

the JFrame that is the owner of this toolbar.

•parentSpecs

Initiates the 'Parent Specs' event

•select

Initiates the 'Select' event

•stream

Initiates the 'Stream' event

•terminator

Initiates the Terminator' event

•timers

Initiates the Timers' event

•types

Initiates the Types' event

Constructor Index

ToolBar(Editor)

Constructs a new ToolBar object

Method Index

•actionPerformed(ActionEvent)

Handles the action events that occur when one of the buttons in this toolbar is selected

enableSelectButton()

This method is called after another operation is finished associated with another button in the toolbar.

•<u>setOperatorButton(boolean)</u>

Variables

private javax.swing.JButton operator

Operator

Initiates the 'Operator' event

•terminator

private javax.swing.JButton terminator

Initiates the Terminator' event

•stream

private javax.swing.JButton stream
Initiates the 'Stream' event

Select

private javax.swing.JButton select
Initiates the 'Select' event

types

private javax.swing.JButton types
Initiates the Types'event

parentSpecs

private javax.swing.JButton parentSpecs
Initiates the Parent Specs' event

• timers

private javax.swing.JButton timers
Initiates the Timers'event

• graphDesc

private javax.swing.JButton graphDesc Initiates the 'Graph Desc' event

•parentFrame

protected Editor parentFrame

the JFrame that is the owner of this toolbar.

CONSTRUCTORS

ToolBar

public ToolBar (Editor frame)

Constructs a new ToolBar object

Parameters:

Methods

@enableSelectButton

public void enableSelectButton()

This method is called after another operation is finished associated with another button in the toolbar. For example, When an operator is drawn on the DrawPanel, the toolbar will go into select mode.

*SetOperatorButton

public void setOperatorButton(boolean flag)

•actionPerformed

public void actionPerformed(java.awt.event.ActionEvent e)

Handles the action events that occur when one of the buttons in this occur when one of the buttons in this selected

Parameters:

e - The associated ActionEvent

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. GraphEditor. TreePanel

public class TreePanel

extends javax.swing.JTree

implements javax.swing.event.TreeSelectionListener, javax.swing.event.TreeModelListener

The treepanel is the place where the hierarchic structure of the prototype is displayed.

Variable Index

model

•parentFrame

the JFrame that is the owner of this panel.

Constructor Index

<u>TreePanel</u>(Editor, Vertex)

Constructs a new TreePanel object

159 Nethod Index

•addNewDFC(DataFlowComponent, DataFlowComponent)

<u>vremoveDfc(DataFlowComponent)</u>

•treeNodesChanged(TreeModelEvent)

•treeNodesInserted(TreeModelEvent)

•treeNodesRemoved(TreeModelEvent)

•treeStructureChanged(TreeModelEvent)

valueChanged(TreeSelectionEvent)

Variables

parentFrame

Editor parentFrame

the JFrame that is the owner of this panel.

model

javax.swing.tree.DefaultTreeModel model

CONSTructors

TreePanel

public TreePanel (Editor frame,

Vertex root

Constructs a new TreePanel object

Parameters:

frame - The parent frame of this treepanel object.

Methods

•addNewDFC

public void addNewDFC(DataFlowComponent dfc,

DataFlowComponent parent)

• removeDfc

public void removeDfc(DataFlowComponent dfc)

•valueChanged

public void

valueChanged(javax.swing.event.TreeSelectionEvent e)

*treeNodesChanged

public void

treeNodesChanged (javax.swing.event.TreeModelEvent e)

treeNodesInserted

160

treeNodesInserted(javax.swing.event.TreeModelEvent e) public void

**IreeNodesRemoved

public void

treeNodesRemoved(javax.swing.event.TreeModelEvent e)

treeStructureChanged

public void

treeStructureChanged(javax.swing.event.TreeModelEvent e)

Class Hierarchy This Package Previous All Packages Index Next

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Graph Editor. Tree Panel Renderer

ı +----javax.swing.JLabel +----Javax.swing.JComponent ----java.awt.Container caps.GraphEditor.TreePanelRenderer +----java.awt.Component java.lang.Object

public class TreePanelRenderer

extends javax.swing.JLabel

implements javax.swing.tree.TreeCellRenderer

Variable Index

defaultFont

•opAtomicIcon

•opCompositeIcon

selected

Whether or not the item that was last configured is selected.

•SelectedBackgroundColor

Color to use for the background when selected.

•stateStreamIcon

•<u>streamIcon</u>

•termAtomicIcon

•termCompositeIcon

Constructor Index

«TreePanelRenderer()

Method Index

•getTreeCellRendererComponent(JTree, Object, boolean, boolean, boolean, int, boolean)

This is messaged from JTree whenever it needs to get the size of the component or it wants to draw it.

paint(Graphics)

paint is subclassed to draw the background correctly.

Variables

•defaultFont

protected static java.awt.Font defaultFont

*termCompositeIcon

protected static javax.swing.ImageIcon termCompositeIcon

termAtomicIcon

protected static javax.swing.ImageIcon termAtomicIcon

OpCompositeIcon

protected static javax.swing.ImageIcon opCompositeIcon

OpAtomicIcon

protected static javax.swing.ImageIcon opAtomicIcon

• streamIcon

protected static javax.swing.ImageIcon streamIcon

• stateStreamIcon

protected static javax.swing.ImageIcon stateStreamIcon

SelectedBackgroundColor

protected static final java.awt.Color SelectedBackgroundColor Color to use for the background when selected.

Selected

protected boolean selected

Whether or not the item that was last configured is selected.

CONSTINCTORS

⊘TreePanelRenderer

public TreePanelRenderer()

Methods 165

• getTreeCellRendererComponent

public java.awt.Component

getTreeCellRendererComponent(javax.swing.JTree tree,

java.lang.Object value,

selected,

boolean leaf, expanded,

int row,

boolean

boolean

boolean

hasFocus)

This is messaged from JTree whenever it needs to get the size of the component or it wants to draw it. This attempts to set the font based on value, which will be a TreeNode.

• paint

public void paint (java.awt.Graphics g)

currently does not allow backgrounds other than white, and it will also paint is subclassed to draw the background correctly. JLabel fill behind the icon. Something that isn't desirable.

Overrides:

paint in class javax.swing.JComponent

Previous This Package Class Hierarchy All Packages Next Index

Class caps. GraphEditor. VertexProperties

9 caps.GraphEditor.VertexProperties

public class VertexProperties

extends javax.swing.JDialog

implements java.awt.event.ActionListener

Variable Index

cancelButton

•changeStatus

-dVertex

• exception Guards Button

•exceptionListButton

•finish Within Label

•formalDescButton

•fwField

•fwReqByButton

•fwUnitsCombo

•guardsPanel

| • met Units Combo | •nameField | • <u>namePanel</u> | •okButton | •okPane! | •operatorCombo | •outputGuardsButton | •parentFrame | •periodField | • <u>periodLabel</u> |
|-------------------|----------------------|----------------------------|-----------------------------|-------------------------|------------------------|------------------------|-------------------|--------------|----------------------|
| •helpButton | • <u>ifCondField</u> | • <u>ifConditionButton</u> | • <u>informalDescButton</u> | • <u>keywordsButton</u> | • <u>keywordsPanel</u> | • <u>languageCombo</u> | • <u>metField</u> | •metLabel | •metRegByButton |

 triggerPanel periodReqByButton

periodUnitsCombo

•targetVertex

•tempVertex

timerOpsButton

•timingCombo

•timingPanel

•TO OPERATOR

•TO TERMINATOR

triggerCombo

triggerReqByButton

•triggerStreamsButton

•UNCHANGED

CONSTINCTOR INDEX

VertexProperties(Editor)

Method Index

•actionPerformed(ActionEvent)

•getUnitsCombo()

•<u>initialize()</u>

•resetTimingPanelComponents()

setButtonText(JButton, Object)

<u>setDisplayVertex</u>(DisplayVertex)

•setVertex(Vertex)

•showErrorDialog(String)

166

Variables

TO OPERATOR

public static final int TO_OPERATOR

TO_TERMINATOR

public static final int TO_TERMINATOR

OUNCHANGED

public static final int UNCHANGED

ChangeStatus

private int changeStatus

•targetVertex

Vertex targetVertex

dVertex

DisplayVertex dvertex

namePanel

javax.swing.JPanel namePanel

triggerPanel

javax.swing.JPanel triggerPanel

timingPanel

javax.swing.JPanel timingPanel

• guardsPanel

javax.swing.JPanel guardsPanel

• keywordsPanel

javax.swing.JPanel keywordsPanel

OkPanel

javax.swing.JPanel okPanel

nameField

javax.swing.JTextField nameField

ifCondField

java.awt.TextArea ifCondField

• metField

javax.swing.JTextField metField

periodField

javax.swing.JTextField periodField

• fwField

javax.swing.JTextField fwField

•metLabel

javax.swing.JLabel metLabel

periodLabel

javax.swing.JLabel periodLabel

• finish Within Label

javax.swing.JLabel finishWithinLabel

Operator Combo

javax.swing.JComboBox operatorCombo

• language Combo

javax.swing.JComboBox languageCombo

• trigger Combo

javax.swing.JComboBox triggerCombo

timingCombo

javax.swing.JComboBox timingCombo

• metUnitsCombo

19 javax.swing.JComboBox metUnitsCombo

period Units Combo

javax.swing.JComboBox periodUnitsCombo

•fw Units Combo

javax.swing.JComboBox fwUnitsCombo

• if Condition Button

javax.swing.JButton ifConditionButton

triggerReqByButton

javax.swing.JButton **triggerReqByButton**

•metReqByButton

javax.swing.JButton metReqByButton

periodReqByButton

javax.swing.JButton periodReqByButton

• fwReqByButton

javax.swing.JButton fwReqByButton

OutputGuardsButton

javax.swing.JButton outputGuardsButton

• exception Guards Button

javax.swing.JButton exceptionGuardsButton

Dexception List Button

javax.swing.JButton exceptionListButton

timerOpsButton

javax.swing.JButton timerOpsButton

• keywordsButton

javax.swing.JButton keywordsButton

informalDescButton

javax.swing.JButton informalDescButton

formalDescButton

javax.swing.JButton formalDescButton

OokButton

javax.swing.JButton okButton

•cancelButton

javax.swing.JButton cancelButton

•helpButton

javax.swing.JButton helpButton

triggerStreamsButton

javax.swing.JButton triggerStreamsButton

parentFrame

Editor parentFrame

•tempVertex

Vertex tempVertex

Constructors

VertexProperties

public VertexProperties (Editor parent)

Methods

• initialize

public void initialize()

• getUnitsCombo

public javax.swing.JComboBox getUnitsCombo()

• setVertex

public void setVertex (Vertex v)

SetDisplayVertex

public void setDisplayVertex (DisplayVertex v)

*resetTimingPanelComponents

public void resetTimingPanelComponents()

•actionPerformed

public void actionPerformed(java.awt.event.ActionEvent e)

ShowErrorDialog

public void showErrorDialog(java.lang.String str)

SetButtonText

 All Packages Class Hierarchy This Package Previous Next Index

Class caps.Psdl.DataFlowComponent

java.lang.Object

+----javax.swing.tree.DefaultMutableTreeNode | +----caps.Psdl.DataFlowComponent

public abstract class DataFlowComponent

extends javax.swing.tree.DefaultMutableTreeNode

DataFlowComponent is the abstract base class of the Vertex and Edge classes. It extends DefaultMutableTreeNode, so every object of this class is actually a tree node.

Variable Index

The id of this component

•<u>label</u>

The label to display on the DrawPanel

•labelFont

The font parameter of the label.

•labelXOffset

The x-offset of the label from the center of the component

label YOffset

The y-offset of the label from the center of the component

•IFont

The font representation of the label.

•met

The met of a Vertex or the latency of a Stream.

•metFont

The font parameter of the met label of this component.

•metlFont

The font representation of the met (or latency).

metXOffset

The x-offset of the met label from the center of this component.

•met YOffset

The y-offset of the met label from the center of this component.

UNIOUE ID

The unique id of components.

Constructor Index

DataFlowComponent(Vertex)

The constructor for this class.

Method Index

•getId()

Returns the id of this component.

egetLabel()

Returns the label of this component.

oget<u>LabelFontIndex()</u>

Returns the label font index of this component.

•getLabelXOffset()

Returns the x-component of the offset of the label.

getLabelYOffset()

Returns the y-component of the offset of the label.

egetlFont()

Returns font of the label.

•getMet()

Returns the met (or latency) of this component.

•getMetFontIndex()

Returns the met (or latency) font index of this component.

•getMetlFont()

Returns font of the met (or latency).

•getMetXOffset()

Returns the x-component of the offset of the met (or latency).

•getMetYOffset()

Returns the y-component of the offset of the met (or latency).

getX()

This abstract method is implemented in the subclasses.

This abstract method is implemented in the subclasses.

•moveTo(int, int)

This abstract method is implemented in the subclasses.

•<u>setId</u>(int)

Sets the id of this component to the specified value.

•setLabel(String)

Sets the label of this component to the specified value.

•setLabelFontIndex(int)

Changes the label font index to the specified value.

•<u>setLabelOffset(int, int)</u>

Changes the label offset to the specified x and y values.

SetLabelXOffset(int)

Sets the x-component of the offset of the label to the specified value.

setLabelYOffset(int)

Sets the y-component of the offset of the label to the specified value.

•setMet(PSDLTime)

Sets the met (or latency) of this component to the specified value.

<u>setMetFontIndex(int)</u>

Changes the met (or latency) font index to the specified value.

setMetOffset(int, int)

Changes the met (or latency) offset to the specified x and y values.

setMetXOffset(int)

Sets the x-component of the offset of the met (or latency) to the specified value.

setMetYOffset(int)

Sets the y-component of the offset of the met (or latency) to the specified value.

•toString()

Returns the name (label) of this component.

Variables

• label

protected java.lang.String label

The label to display on the DrawPanel

OUNIOUE ID

protected static int UNIQUE_ID

The unique id of components.

Pio

protected int id

The id of this component

• label Font

protected int labelFont

The font parameter of the label.

OIFont

protected java.awt.Font lFont

The font representation of the label.

• labelXOffset

protected int labelXOffset

The x-offset of the label from the center of the component

• label Y Offset

protected int label voffset

The y-offset of the label from the center of the component

Dmet

protected PSDLTime met

The met of a Vertex or the latency of a Stream.

•metFont

protected int metFont

The font parameter of the met label of this component.

• metXOffset

protected int metXOffset

The x-offset of the met label from the center of this component.

• met Y Offset

protected int metroffset

The y-offset of the met label from the center of this component.

metiFont 22

protected java.awt.Font metlFont

The font representation of the met (or latency).

Constructors

*DataFlowComponent

protected DataFlowComponent(Vertex v)

The constructor for this class.

Parameters:

v - The parent vertex of this component

Methods

• getId

public int getId()

Returns the id of this component.

Setld

public void setid(int i)

Sets the id of this component to the specified value.

• setLabel

public void setLabel (java.lang.String s)

Sets the label of this component to the specified value.

• getLabel

public java.lang.String getLabel()

Returns the label of this component.

getLabelXOffset

public int getLabelXOffset()

Returns the x-component of the offset of the label.

SetLabelXOffset

public void setLabelXOffset(int xLoc)

Sets the x-component of the offset of the label to the specified alue.

• setLabelYOffset

public void setLabelYOffset (int yLoc)

Sets the y-component of the offset of the label to the specified

value

• getLabelYOffset

public int getLabelYOffset()

Returns the y-component of the offset of the label.

• setLabelOffset

public void setLabelOffset(int xOffset,
 int yOffset)

Changes the label offset to the specified x and y values.

• getlFont

public java.awt.Font getlFont()

Returns font of the label.

• setMet

12 public void setMet(PSDLTime s)

Sets the met (or latency) of this component to the specified value.

• getMet

public PSDLTime getMet()

Returns the met (or latency) of this component.

getMetXOffset

public int getMetXOffset()

Returns the x-component of the offset of the met (or latency).

• setMetXOffset

public void setMetXOffset(int xLoc)

Sets the x-component of the offset of the met (or latency) to the specified value.

• setMetYOffset

public void setMetYOffset (int yLoc)

Sets the y-component of the offset of the met (or latency) to the specified value.

• getMetYOffset

public int getMetYOffset()

Returns the y-component of the offset of the met (or latency).

SetMetOffset

public void setMetOffset(int xOffset,
 int yOffset)

Changes the met (or latency) offset to the specified x and y values.

• getMetlFont

public java.awt.Font getMetlFont()

Returns font of the met (or latency).

• getX

public abstract int getx()

This abstract method is implemented in the subclasses.

• get Y

public abstract int getY()

This abstract method is implemented in the subclasses.

•moveTo

public abstract void moveTo(int xOffset,
 int yOffset)

This abstract method is implemented in the subclasses.

• toString

public java.lang.String toString()

Returns the name (label) of this component.

Overrides:

toString in class javax.swing.tree.DefaultMutableTreeNode

*SetLabelFontIndex

public void setLabelFontIndex(int f)

Changes the label font index to the specified value.

**BetLabelFontIndex

public int getLabelFontIndex()

Returns the label font index of this component.

•setMetFontIndex

public void setMetFontIndex(int f)

Changes the met (or latency) font index to the specified value.

• getMetFontIndex

public int getMetFontIndex()

Returns the met (or latency) font index of this component.

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Psdl. Data Types

public class DataTypes

extends java.lang.Object

Variable Index

<u>eimpls</u>

•sbecs

•types

CONSTRUCTOR INDEX

DataTypes()

Method Index

•addType(String)

•addType(String, String, String)

• <u>build</u>(StreamTokenizer)

•buildTypes(File)

•buildTypes(String)

exists(String)

•getNextToken(StreamTokenizer)

•isPredefined(String)

removeElements()

*toString()

Variables

•types

private java.util.Vector types

•specs

private java.util.Vector specs

• impls

private java.util.Vector impls

Constructors

DataTypes

public DataTypes()

Methods

•addType

public void addType(java.lang.String name,
 java.lang.String spec,
 java.lang.String impl)

•addType

public void addType (java.lang.String name)

• exists

public boolean exists (java.lang.String name)

DisPredefined

public boolean isPredefined (java.lang.String str)

buildTypes

public void buildTypes (java.io.File file)

•buildTypes

public void buildTypes(java.lang.String s)

• build

by private void **build**(java.io.StreamTokenizer tok)

• getNextToken

public java.lang.String
getNextToken(java.io.StreamTokenizer tok) throws
java.io.IOException

• remove Elements

public void removeElements()

•toString

public java.lang.String toString()

Overrides:

toString in class java.lang.Object

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Psdl. Edge

public class Edge

extends DataFlowComponent

Edge represents a stream in the data flow diagram It is also a TreeNode object

Variable Index

destination

The destination Vertex of this stream.

•initial Value

The initial value of the stream.

isState

True if this is a state stream.

points

The vector that holds the control points of this stream.

•selectedHandleIndex

The index of the handle that the mouse is pressed on.

source

The source Vertex of this stream.

streamType

The type name of the stream.

>

177

The x location of this stream in the DrawPanel.

>

The y location of this stream in the DrawPanel.

Constructor Index

∘Edge(int, int, Vertex)

The constructor for this class.

Method Index

•addPoint(int, int)

Adds a new point to the control points.

correctEndingPoints()

Locates the ending points of this stream on the perimeter of the source and destination.

correctLabelOffset()

Sets the location of this stream to the middle control point.

•<u>delete()</u>

Deletes this stream.

•delete(boolean)

Deletes this stream.

•deleteHelper()

Helper method to delete the stream.

getDestination()

Returns the destination Vertex of this stream.

getInitialValue()

Returns the initial value of this stream.

•getPoints()

Returns the control points vector.

egetSource()

Returns the source Vertex of this stream.

•getStreamType()

Returns the type of this stream.

•getX()

Returns the x value of this stream.

•getY()

Returns the y value of this stream.

•isStateStream()

Returns true if this is a state stream.

•moveTo(int, int)

Relocates the stream when the stream is moved with other objects.

reShape(int, int)

Is called when one of the handles of the stream is dragged in the DrawPanel.

<u>setDestination</u>(Vertex)

Sets the destination Vertex of this stream to the specified value.

•setInitialControlPoints(String)

Called to extract a string representation of the control points.

setInitialValue(String)

Sets the initial value of this stream to the specified value.

•<u>setSelectedHandleIndex</u>(int)

Changes selectedHandleIndex to the specified value.

setSource(Vertex)

Sets the source Vertex of this stream to the specified value.

•setStateStream(boolean)

Changes the isState field to the specified value.

setStreamType(String)

Sets the type of this stream to the specified value.

•setX(int)

Changes the x value of the stream to the specified value.

set Y (int)

Changes the y value of the stream to the specified value.

Variables

Source

protected Vertex source

The source Vertex of this stream.

destination

protected Vertex destination

The destination Vertex of this stream.

• points

protected java.util.Vector points

The vector that holds the control points of this stream.

• stream Type

protected java.lang.String streamType

The type name of the stream.

• initial Value

protected java.lang.String initialValue

The initial value of the stream.

• isState

protected boolean isstate

179

True if this is a state stream.

×

protected int x

The x location of this stream in the DrawPanel.

>

protected int ${f y}$

The y location of this stream in the DrawPanel.

• selected Handle Index

protected int selected HandleIndex

The index of the handle that the mouse is pressed on.

CONSTructors

Edge

public Edge(int xLocation, int yLocation, Vertex v) The constructor for this class.

Parameters:

v - the parent vertex of this edge.

Methods

•moveTo

Relocates the stream when the stream is moved with other objects.

Overrides:

moveTo in class DataFlowComponent

•reShape

public void reshape(int xLocation,
 int yLocation)

Is called when one of the handles of the stream is dragged in the DrawPanel.

SetX

public void setx(int newX)

Changes the x value of the stream to the specified value.

SetV

public void setY(int newY)

Changes the y value of the stream to the specified value.

•setSelectedHandleIndex

public void setSelectedHandleIndex(int i)

Changes selectedHandleIndex to the specified value.

OpetX

public int getx()

Returns the x value of this stream.

Overrides:

getX in class DataFlowComponent

180

• get Y

public int getY()

Returns the y value of this stream.

Overrides:

getY in class DataFlowComponent

• getSource

public Vertex getSource()

Returns the source Vertex of this stream.

• setSource

public void setSource (Vertex v)

Sets the source Vertex of this stream to the specified value.

• getDestination

public Vertex getDestination()

Returns the destination Vertex of this stream.

•setDestination

public void setDestination (Vertex v)

Sets the destination Vertex of this stream to the specified value.

• getStreamType

public java.lang.String getStreamType()

Returns the type of this stream.

•setStreamType

public void setStreamType (java.lang.String type)

Sets the type of this stream to the specified value.

OisStateStream

public boolean isStateStream()

Returns true if this is a state stream.

• setStateStream

public void setStateStream(boolean flag)

Changes the isState field to the specified value.

• getInitialValue

public java.lang.String getInitialValue()

Returns the initial value of this stream.

• setInitial Value

public void setInitialValue(java.lang.String str)

Sets the initial value of this stream to the specified value.

•addPoint

public void addPoint(int x,
 int v)

Adds a new point to the control points. Also adds the middle point of the control points.

Parameters:

- x the x component of the new conrol point.
- y the y component of the new conrol point.

• getPoints

public java.util.Vector getPoints()

Returns the control points vector.

•correctLabelOffset

public void correctlabelOffset()

Sets the location of this stream to the middle control point.

• correct Ending Points

public void correctEndingPoints()

Locates the ending points of this stream on the perimeter of the source and destination.

• setInitialControlPoints

public void setInitialControlPoints (java.lang.String exp)

Called to extract a string representation of the control points. Constructs the points vector from the string expression.

delete

public void delete(boolean deletingInEdge)

Deletes this stream.

•delete

public void delete()

Deletes this stream.

• deleteHelper

public void deleteHelper()

Helper method to delete the stream.

All Packages Class Hierarchy This Package Previ

All Packages Class Hierarchy This Package Previous Next Index

Class caps.Psdl.External

public class External

extends Vertex

Constructor Index

External (int, int, Vertex)

Method Index

•getIntersectionPoint(Point)

CONSTructors

External

public External(int xLocation,
 int yLocation,
 Vertex v)

Methods

• getIntersectionPoint

public java.awt.Point getIntersectionPoint(java.awt.Point p)

Overrides:

getIntersectionPoint in class Vertex

All Packages Class Hierarchy This Package Previous Next Index

All Packages Class Hierarchy This Package Previous

Next Index

Class caps. Psdl. PSDL Time

java.lang.Object |

+---caps.Psdl.PSDLTime

public class PSDLTime

extends java.lang.Object

This class represents a combination of time value from an integer that represents the time and another integer that represents the unit.

Variable Index

hours

The constant value for hours.

microsec

The constant value for microseconds.

min

The constant value for minutes.

•ms

The constant value for miliseconds.

Sec

The constant value for seconds.

•units

The units of the time.

•value

The value of the time.

Constructor Index

PSDLTime()

The constructor for this class.

PSDLTime(int, int)

The constructor for this class.

Method Index

getTimeUnits()

Returns the time units of this object.

getTimeValue()

Returns the time time value of this object.

•setTimeUnits(int)

Sets the time unit to the specified argument.

•setTimeUnits(String)

Sets the time unit to the specified argument.

•setTimeValue(int)

Sets the time value to the specified argument.

•toString()

Returns a string representation of this object.

Variables

184 microsec

public static final int microsec

The constant value for microseconds.

O I

public static final int ms

The constant value for miliseconds.

Sec

public static final int sec

The constant value for seconds.

min

public static final int min

The constant value for minutes.

hours

public static final int hours

The constant value for hours.

value

private int value

The value of the time.

units

private int units

The units of the time.

CONSTructors

PSDL Time

public PSDLTime()

The constructor for this class.

PSDLTime

public PSDLTime(int timeValue,
 int timeUnits)

The constructor for this class.

Parameters:

timeValue - the value of the time.

timeUnits - the unit of the time.

Methods

• getTimeValue

public int getrimeValue()

Returns the time time value of this object.

• setTimeValue

public void setrimeValue (int timeValue)

Sets the time value to the specified argument.

• getTimeUnits

public int getTimeUnits()

Returns the time units of this object.

•setTimeUnits

public void setTimeUnits(int timeUnits)

Sets the time unit to the specified argument.

• setTimeUnits

public void setTimeUnits(java.lang.String u)

Sets the time unit to the specified argument.

•toString

public java.lang.String toString()

Returns a string representation of this object.

Returns:

the string representation in the form of "12 sec"

Overrides:

toString in class java.lang.Object

All Packages Class Hierarchy This Package Previous Next Index

ject.

All Packages Class Hierarchy This Package Previous Next Index

Class caps. Psdl. Vertex

+----javax.swing.tree.DefaultMutableTreeNode +---caps.Psdl.DataFlowComponent +---caps.Psdl.Vertex java.lang.Object

public class Vertex

extends DataFlowComponent

This class represents a terminator or an operator. It holds the data structures that represent the constructs for the Vertex. 186

Variable Index

BY ALL

The constant value for Vertices that have "BY ALL" triggering construct.

BY SOME

The constant value for Vertices that have "BY SOME" triggering

construct.

color

The color parameter of this component.

exceptionGuardList

exceptionList

•finishWithin

•finishWithinReqmts

•formalDesc

•genericList

graphDesc

•height

The height of this component.

• if Condition

| •inEdges •informalDesc •informalDesc •INITIAL RADIUS The constant value for the intitial radius of a Vertex. •mcp •mcp •mcp •mcpReqmts •mcReqmts | •NON TIME CRITICAL The constant value for non-time ciritical Vertices. •outEdges •period The constant value for periodic Vertices. •periodRegmts •periodRegmts •specRegmts •specRegmts |
|---|---|
| •mrtReqmts | True if this Vertex is a terminator. •timerList |

•timerOpList

•timingType

•triggerReqmts

triggerStreamsList

triggerType

188

UNPROTECTED

The constant value for unprotected Vertices.

•width

The width of this component.

×

The x-location of this component on the DrawPanel

⋛

The y-location of this component on the DrawPanel

Constructor Index

Vertex (int, int, Vertex, boolean)

The constructor for this class.

Method Index

•addInEdge(Edge)

Adds a new Edge to the inEdges Vector.

•addOutEdge(Edge)

Adds a new Edge to the outEdges Vector.

•correctInOutStreams()

Corrects the ending points of the in and out streams of this component.

•delete()

Deletes this Vertex.

extractList(Vector)

Extracts an idList which is represented as a Vector and returns a String representation of the idList so that it will have the form "id1, id2, id3..."

extractString(String, boolean)

Called from getSpecification.

•getColor()

Returns the color value for this Vertex.

*getExceptionGuardList()

Returns the exception guard list of this Vertex.

getExceptionList()

Returns the exception list of this Vertex.

•getFinishWithin()

Returns the finish within value of this Vertex.

•getFinishWithinRegmts()

Returns the finish within requirements of this Vertex.

egetFormalDesc()

· Returns the formal description of this Vertex.

•getGenericList()

Returns the generic list of this Vertex.

•getGraphDesc()

Returns the infornmal graph description of this Vertex.

egetHeight()

Returns the height of this component.

•getIfCondition()

Returns the if condition of this Vertex.

egetImpLanguage()

Returns the implementation language of this Vertex.

•getInformalDesc()

Returns the informal description of this Vertex.

*getIntersectionPoint(Point)

Returns intersection point of this vertex with the specified point.

•getKeywordList()

Returns the keywords of this Vertex.

•getMcp()

Returns the mcp value of this Vertex.

•getMcpReqmts()

Returns the mcp requirements of this Vertex.

•getMetReqmts()

Returns the met requirements of this Vertex.

•getMrt()

Returns the mrt value of this Vertex.

•getMrtReqmts()

Returns the mrt requirements of this Vertex.

•getOperatorIntersection(Point)

Returns the intersection point of this vertex with the specified point.

•getOutputGuardList()

Returns the y component of the location of this Vertex. Returns the x component of the location of this Vertex Sets the location of this component on the screen. Returns true if this component is a terminator. Returns the triggering streams of this Vertex. Removes an Edge from the outEdges Vector. Removes an Edge from the in Edges Vector. Returns the triggering type of this Vertex. Changes the color value for this Vertex. Returns the width of this component. •setExceptionGuardList(String) •removeOutEdge(Edge) eremoveInEdge(Edge) •getTriggerType() emoveTo(int, int) •isTerminator() <u>setColor(int)</u> •getWidth() $\bullet get X()$ egetY() Returns the intersection point of this vertex with the specified point. Creates the specification construct from its data structures. Returns the trigger requirements of this Vertex. Returns the period requirements of this Vertex. Returns the spec requirements of this Vertex. Returns the output guard list of this Vertex. Returns the period value of this Vertex. Returns the timer op list of this Vertex. Returns the timing type of this Vertex. Returns the timers of this Vertex. •getTerminatorIntersection(Point) egetSpecification(boolean) •getTriggerStreamsList() egetTriggerReqmts() •getPeriodReqmts() •getTimerOpList() egetSpecReqmts() •getTimingType() •getTimerList() •getPeriod()

190

Sets the exception guards list to the specified value.

setExceptionList(String)

Sets the exception list to the specified value.

setFinishWithin(PSDLTime)

Sets the finish within to the specified value.

<u>setFinishWithinRegmts(Vector)</u>

Sets the finish within requirements to the specified value.

•setFormalDesc(String)

Sets the formal description to the specified value.

• <u>setGenericList</u>(String)

Sets the generic list to the specified value.

•setGraphDesc(String)

Sets the graph description to the specified value.

<u>setIfCondition</u>(String)

Sets the if condition to the specified value.

<u>setImpLanguage</u>(String)

Sets the implementation language to the specified value.

setInformalDesc(String)

Sets the informal description to the specified value.

•setKeywordList(Vector)

Sets the keywords to the specified value.

SetLocation(int, int)

Sets the location of this component on the screen.

setMcp(PSDLTime)

Sets the mcp to the specified value.

•setMcpReqmts(Vector)

Sets the mcp requirements to the specified value.

<u>setMetReqmts</u>(Vector)

Sets the met requirements to the specified value.

•setMrt(PSDLTime)

Sets the mrt to the specified value.

setMrtReqmts(Vector)

Sets the mrt requirements to the specified value.

*<u>setOutputGuardList</u>(String)

Sets the output guard list to the specified value.

setPeriod(PSDLTime)

Sets the period to the specified value.

*SetPeriodReqmts(Vector)

Sets the period regirements to the specified value.

•setTerminator(boolean)

Sets this component as a terminator or a stream.

•setTimerList(Vector)

Sets the timer list to the specified value.

setTimerOpList(String)

Sets the timer op list to the specified value.

•setTimingType(int)

Sets the timing type to the specified value.

•<u>setTriggerReqmts</u>(Vector)

Sets the trigger requirements to the specified value.

setTriggerStreamsList(Vector)

Sets the trigger streams list to the specified value.

•setTriggerType(int)

Sets the triggering type to the specified value.

setWidth(int)

Changes the width of this component.

setX(int)

Changes the x component of the location of this Vertex

set Y(int)

Changes the y component of the location of this Vertex.

Variables

•INITIAL_RADIUS

public static final int INITIAL RADIUS

The constant value for the intitial radius of a Vertex.

ONON_TIME_CRITICAL

public static final int NON_TIME_CRITICAL

The constant value for non-time ciritical Vertices.

• PERIODIC

public static final int PERIODIC

The constant value for periodic Vertices.

©SPORADIC

public static final int SPORADIC

The constant value for sporadic Vertices.

UNPROTECTED

public static final int UNPROTECTED

The constant value for unprotected Vertices.

•BY_SOME

public static final int BY_SOME

The constant value for Vertices that have "BY SOME" triggering construct.

•BY_ALL

public static final int BY_ALL

The constant value for Vertices that have "BY ALL" triggering

construct.

terminator

protected boolean terminator

True if this Vertex is a terminator.

>

protected int x

The x-location of this component on the DrawPanel

<u>^</u>

protected int ${f y}$

The y-location of this component on the DrawPanel

• width

protected int width

The width of this component. It serves as the radius of an operator and the width of a terminator width of operator .cap

height

protected int height

The height of this component.

Color

protected int color

The color parameter of this component.

•metReqmts

protected java.util.Vector metRegmts

period

protected PSDLTime period

• period Reqmts

protected java.util.Vector periodRegmts

• finish Within

protected PSDLTime finishwithin

• finish Within Reqmts

protected java.util.Vector finishWithinRegmts

•mcp

protected PSDLTime mcp

• mcpReqmts

protected java.util.Vector mcpReqmts

•mrt

protected PSDLTime mrt

•mrtReqmts

protected java.util.Vector mrtRegmts

timingType

protected int timingType

triggerType

protected int triggerrype

• trigger Reqmts

protected java.util.Vector triggerReqmts

triggerStreamsList

protected java.util.Vector triggerStreamsList

• if Condition

protected java.lang.String ifCondition

• outputGuardList

protected java.lang.String outputGuardList

exceptionGuardList

protected java.lang.String exceptionGuardList

exceptionList

protected java.lang.String exceptionList

•timerOpList

protected java.lang.String timeropList

protected java.util.Vector keywordList

• informalDesc

protected java.lang.String informalDesc

• formalDesc

protected java.lang.String formalDesc

• in Edges

protected java.util.Vector inEdges

194 SoutEdges

protected java.util.Vector outEdges

• impLanguage

protected java.lang.String implanguage

timerList

protected java.util.Vector timerList

graphDesc

protected java.lang.String graphDesc

• genericList

protected java.lang.String genericList

SpecReqmts

protected java.util.Vector specReqmts

CONSTINCTORS

Vertex

public Vertex(int xLocation,
 int yLocation,
 Vertex v,
 boolean t)

The constructor for this class.

Parameters:

xlocation - The x component of the location of this component.

ylocation - The y component of the location of this component.

v - The parent vertex of this component.

t - true if this component is a terminator.

Methods

SetLocation

public void setLocation(int xOffset,
 int yOffset)

Sets the location of this component on the screen. Also corrects the location of the ending streams.

Parameters:

xLocation - The new x component of the location on the drawpanel yLocation - The new y component of the location on the drawpanel

•moveTo

public void moveTo(int xOffset,
 int yOffset)

Sets the location of this component on the screen.

Parameters:

xLocation - The new x component of the location on the drawpanel yLocation - The new y component of the location on the drawpanel

Overrides:

moveTo in class DataFlowComponent

• is Terminator

public boolean isTerminator()

Returns true if this component is a terminator.

Set Returns:

true if this component is a terminator.

SetTerminator

public void setTerminator (boolean b)

Sets this component as a terminator or a stream. Also changes the width of the component.

Parameters:

p. -

• correctInOutStreams

public void correctinOutStreams()

Corrects the ending points of the in and out streams of this component.

• getWidth

public int getwidth()

Returns the width of this component.

Returns:

the width of this component.

• setWidth

public void setwidth (int w)

Changes the width of this component.

Parameters:

w - the new width of this component.

• getHeight

public int getHeight()

Returns the height of this component.

Returns:

the height of this component.

• getX

public int getx()

Returns the x component of the location of this Vertex

Returns:

_

Overrides:

getX in class DataFlowComponent

OsetX

public void setx(int xLoc)

Changes the x component of the location of this Vertex

Parameters:

xLoc. -

SetY

public void setY (int yLoc)

Changes the y component of the location of this Vertex.

Parameters:

yLoc. -

• getY

9 public int getY()

Returns the y component of the location of this Vertex.

Returns:

>

Overrides:

getY in class DataFlowComponent

• setColor

public void setColor(int c)

Changes the color value for this Vertex.

Parameters:

c - the new color value.

• getColor

public int getColor()

Returns the color value for this Vertex.

Returns:

the color value of the Vertex.

•addInEdge

public void addInEdge (Edge e)

Adds a new Edge to the inEdges Vector.

Parameters:

e - the new inEdge.

•removeInEdge

public void removeInEdge (Edge e)

Removes an Edge from the in Edges Vector.

Parameters:

e - the inEdge to be removed.

•addOutEdge

public void addoutEdge (Edge e)

Adds a new Edge to the outEdges Vector.

Parameters:

e - the new outEdge.

•removeOutEdge

public void removeOutEdge (Edge e)

Removes an Edge from the outEdges Vector.

Parameters:

e - the outEdge to be removed.

• getTimingType

public int getrimingType()

Returns the timing type of this Vertex.

• setTimingType

public void setrimingType (int type)

Sets the timing type to the specified value.

• getTriggerType

public int getTriggerType()

Returns the triggering type of this Vertex.

197

SetTriggerType

public void seturiggerType (int type)

Sets the triggering type to the specified value.

• getPeriod

public PSDLTime getPeriod()

Returns the period value of this Vertex.

• getFinishWithin

public PSDLTime getFinishWithin()

Returns the finish within value of this Vertex.

• getMcp

public PSDLTime getMcp()

Returns the mcp value of this Vertex.

• getlMrt

public PSDLTime getMrt()

Returns the mrt value of this Vertex.

• setPeriod

public void setPeriod(PSDLTime p)

Sets the period to the specified value.

SetFinishWithin

public void setFinishWithin(PSDLTime fw)

Sets the finish within to the specified value.

• setlMcp

public void setMcp(PSDLTime m)

Sets the mcp to the specified value.

•setMrt

public void setMrt (PSDLTime mr)

Sets the mrt to the specified value.

• getImpLanguage

public java.lang.String getImpLanguage()

Returns the implementation language of this Vertex.

SetImpLanguage

public void setImplanguage (java.lang.String s)

Sets the implementation language to the specified value.

• getMetReqmts

public java.util.Vector getMetRegmts()

Returns the met requirements of this Vertex.

SetMetReqmts

public void setMetReqmts(java.util.Vector v)

Sets the met requirements to the specified value.

• getPeriodReqmts

public java.util.Vector getPeriodRegmts()
Returns the period requirements of this Vertex.

• setPeriodReqmts

public void setPeriodRegmts(java.util.Vector v)
Sets the period reqirements to the specified value.

• getFinishWithinReqmts

public java.util.Vector getFinishwithinRegmts()
Returns the finish within requirements of this Vertex.

198

• setFinish Within Reqmts

public void setFinishWithinReqmts(java.util.Vector v)

Sets the finish within requirements to the specified value.

• getMcpReqmts

public java.util.Vector getMcpRegmts()
Returns the mcp requirements of this Vertex.

SetMcpReqmts

public void **setMcpReqmts**(java.util.Vector v)

Sets the mcp requirements to the specified value.

• getMrtReqmts

public java.util.Vector getMrtRegmts()

Returns the mrt requirements of this Vertex.

• setMrtReqmts

public void setMrtRegmts(java.util.Vector v)
Sets the mrt requirements to the specified value.

• getTriggerReqmts

public java.util.Vector getTriggerRegmts()
Returns the trigger requirements of this Vertex.

SetTriggerReqmts

public void setTriggerRegmts(java.util.Vector v)
Sets the trigger requirements to the specified value.

• getTriggerStreamsList

public java.util.Vector getTriggerStreamsList()
Returns the triggering streams of this Vertex.

• setTriggerStreamsList

public void setTriggerStreamsList(java.util.Vector v)
Sets the trigger streams list to the specified value.

• getIfCondition

public java.lang.String getIfCondition()
Returns the if condition of this Vertex.

• setIfCondition

public void setIfCondition(java.lang.String s)
Sets the if condition to the specified value.

public java.lang.String getOutputGuardList()

Returns the output guard list of this Vertex.

• setOutputGuardList

public void setOutputGuardList (java.lang.String s)
Sets the output guard list to the specified value.

getExceptionGuardList

public java.lang.String getExceptionGuardList()
Returns the exception guard list of this Vertex.

SetExceptionGuardList

public void setExceptionGuardList(java.lang.String s)
Sets the exception guards list to the specified value.

getExceptionList

public java.lang.String getExceptionList()
Returns the exception list of this Vertex.

199

SetExceptionList

public void setExceptionList(java.lang.String s)
Sets the exception list to the specified value.

getTimerOpList

public java.lang.String getTimerOpList()

Returns the timer op list of this Vertex.

SetTimerOpList

public void setTimerOpList(java.lang.String s)
Sets the timer op list to the specified value.

• getInformalDesc

public java.lang.String getInformalDesc()

Returns the informal description of this Vertex.

• setInformalDesc

public void **setInformalDesc**(java.lang.String s)

Sets the informal description to the specified value.

• getFormalDesc

public java.lang.String getFormalDesc()

Returns the formal description of this Vertex.

• setFormalDesc

public void **setFormalDesc**(java.lang.String s)

Sets the formal description to the specified value.

• getKeywordList

public java.util.Vector getReywordList()
Returns the keywords of this Vertex.

• setKeywordList

public void setKeywordList(java.util.Vector v)
Sets the keywords to the specified value.

• getTimerList

public java.util.Vector getTimerList()
Returns the timers of this Vertex.

SetTimerList

public void **setTimerList**(java.util.Vector v)

Sets the timer list to the specified value.

• getGraphDesc

public java.lang.String getGraphDesc()

Returns the infornmal graph description of this Vertex.

• setGraphDesc

public void setGraphDesc(java.lang.String s)

Sets the graph description to the specified value.

• getGenericList

public java.lang.String getGenericList()

Returns the generic list of this Vertex.

SetGenericList

public void setGenericList (java.lang.String s)

Sets the generic list to the specified value.

• getSpecReqmts

public java.util.Vector getSpecReqmts()

Returns the spec requirements of this Vertex.

getIntersectionPoint

public java.awt.Point getIntersectionPoint(java.awt.Point
p)

Returns intersection point of this vertex with the specified point.

getTerminatorIntersection

public java.awt.Point

getTerminatorIntersection(java.awt.Point p)

Returns the intersection point of this vertex with the specified point. Called from getIntersectionPoint when this Vertex is a Terminator

getOperatorIntersection

public java.awt.Point
getOperatorIntersection(java.awt.Point p)

Returns the intersection point of this vertex with the specified point. Called from getIntersectionPoint when this Vertex is an Operator.

• getSpecification

public java.lang.String getSpecification(boolean hasId)

Creates the specification construct from its data structures.

Parameters:

hasId - boolean value that specifies if this Vertex has a unique id.

Returns:

returns the string representation of the specification of this Vertex.

extractString

Called from getSpecification. Extracts the string parameter and reformats it to add to the specification.

• extractList

public java.lang.String extractList(java.util.Vector v)

Extracts an idList which is represented as a Vector and returns a String representation of the idList so that it will have the form "id1, id2, id2,"

• delete

public void delete()

Deletes this Vertex. Deletes all the children of this Vertex and also deletes all the in and out Edges.

All Packages Class Hierarchy This Package Previo

200

APPENDIX D. SOURCE CODE

caps.Caps, 202

caps.CAPSMain.CAPSMainMenuBar, 202
caps.CAPSMain.CAPSMainWindow, 203
caps.CAPSMain.DataBasesMenu, 205
caps.CAPSMain.EditMenu, 206
caps.CAPSMain.ExecSupportMenu, 207
caps.CAPSMain.ExitCAPSMain, 208
caps.CAPSMain.HelpMenu, 209
caps.CAPSMain.PrototypeMenu, 209

caps.Display.DisplayComponent, 212 caps.Display.DisplayExternal, 214 caps.Display.DisplayVertex, 215 caps.Display.EdgePath, 217

caps.GraphEditor.ColorConstants, 219
caps.GraphEditor.DrawPanel, 219
caps.GraphEditor.EdgeProperties, 231
caps.GraphEditor.Editor, 233
caps.GraphEditor.EditorMenuBar, 236
caps.GraphEditor.ExitEditor, 237
caps.GraphEditor.FontConstants, 237
caps.GraphEditor.GE_EditMenu, 238
caps.GraphEditor.GE_FileMenu, 239
caps.GraphEditor.GE_HelpMenu, 241
caps.GraphEditor.GE_PSDLMenu, 242

caps.GraphEditor.GE_ViewMenu, 243
caps.GraphEditor.IdListEditor, 245
caps.GraphEditor.Popup, 247
caps.GraphEditor.PrintJob, 248
caps.GraphEditor.StatusBar, 250
caps.GraphEditor.TextEditor, 250
caps.GraphEditor.ToolBar, 252
caps.GraphEditor.TreePanel, 254
caps.GraphEditor.TreePanelRenderer, 256
caps.GraphEditor.VertexProperties, 257

caps.Psdl.DataFlowComponent, 265
caps.Psdl.DataTypes, 269
caps.Psdl.Edge, 271
caps.Psdl.External, 275
caps.Psdl.PSDLTime, 276
caps.Psdl.Vertex, 277

```
* The menubar of the main CAPS window.
                                                                                                                                                                                                                                                            * The constructor for this class.
                                                                                                                                       * @author Ilker DURANLIOGLU
                                       import javax.swing.JMenuBar;
                                                                                                                                                                                                                                                                                                                                                                                                                           // Add the menus
package caps.CAPSMain;
                                                                                                                                                                                                                                                                                                                                                                                       super ();
                                                                                                                                                         * @version
                                                                                                                                                                                                                                                                                                                       * (No command line parameter is necessary for this program.)
                                                                                                                                                                                                                                                                                                                                                                                                     CAPSMainWindow main = new CAPSMainWindow ();
                                                                                                                                                                                                                                                                                                    * @param args[] The command line parameters.
                                                                                                                                                                                                                                                                                                                                                              public static void main (String args [])
                                                                                                                                                                                                                                                            * The constructor for this class.
                                                                                             * The driver program for CAPS.
                                                                                                                                     * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                      import caps.CAPSMain.*;
                                                                                                                                                                                                  public class Caps (
package caps;
                                                                                                                                                         * @version
```

```
* @param owner The parent class which has declared this menubar.
                                                                                                                                                                                                                             public CAPSMainMenuBar (CAPSMainWindow owner)
public class CAPSMainMenuBar extends JMenuBar (
                                                                                                                                                                                                                                                                                                                                                                                             add (new PrototypeMenu (owner));
add (new EditMenu (owner));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   } // End of the class CAPSMAinMenuBar
                                                                                                                                                                                                                                                                                                                                                                                                                                                           add (new DatabasesMenu ());
add (new ExecSupportMenu ());
add (new HelpMenu ());
```

```
JLabel capsLabel = new JLabel ("Heterogeneous System Integrator");
capsLabel.setFont (new Font ("Courier", Font.BOLD, 17));
                                                                                                                                                                                        setLocation(screenSize.width - (WIDTH + WIDTH / 2), HEIGHT / 2);
                                                         * Places the frame in the upper-right corner of the screen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Greturn the vector that contains the open prototype files.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Returns the vector that holds the open prototype files.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * @param f The File that contains the PSDL prototype.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JLabel imageLabel = new JLabel (new ImageIcon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 panel.add (Box.createHorizontalStrut (5));
panel.add (imageLabel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               panel.add (Box.createHorizontalStrut (5));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           panel.add (Box.createHorizontalStrut (5));
                                                                                                                                                                                                                                                                                                                        setJMenuBar (new CAPSMainMenuBar (this));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sets the prototype file to the argument.
                                                                                                                                                         Toolkit.getDefaultToolkit().getScreenSize();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public Vector getOpenPrototypes ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            getContentPane ().add (panel);
                                                                                                                                                                                                                                                                                                                                                                                         JPanel panel = new JPanel ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void setPrototype (File
                                                                                                                            Dimension screenSize =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (capsLabel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return openPrototypes;
                                                                                                                                                                                                                                                            setResizable (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ("caps/Images/caps.gif"));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       setVisible (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               prototype =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         panel.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        pack ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       setDefaultCloseOperation(WindowConstants.DO_NOTHING_ON_CLOSE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // The title of the frame.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * The Vector that holds references to the open prototypes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   addWindowListener (new ExitCAPSMain (this));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * The File that contains the PSDL prototype.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public class CAPSMainWindow extends JFrame
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         openPrototypes = new Vector (0, 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Initializes the CAPS main window.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       private static Vector openPrototypes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * The constructor for this class
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               super ("HSI Designer Mode");
                                                                                                                                                         import caps.Builder.PsdlBuilder;
                                                                                                                                                                                                                                                         import caps.GraphEditor.Editor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                     import java.util.Vector;
import java.util.Enumeration;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public CAPSMainWindow ()
                                                                                                                                                                                           import caps.Psdl.Vertex;
import caps.Psdl.DataTypes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public void initialize
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             private File prototype;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     * The main CAPS window.
                                                                                                                                                                                                                                                                                              java.awt.event.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  prototype = null;
package caps.CAPSMain;
                                                                                           import javax.swing.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             initialize ();
                                                                                                                                  java.io.File;
                                                                 import java.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * @version
                                                                                                                               import
                                                                                                                                                                                                                                                                                           import
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             **/
```

```
e.getRoot ().getLabel
                                                                                                                                                                                                                                                                                                                    * @param e the editor that is going to be removed from the vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         int ix = JOptionPane.showConfirmDialog (this, new String
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Checks if the status of any of the open prototypes is
                                                                                                                                                                                                                                                    * Removes one element from the openPrototypes vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Greturn true if none of the prototypes need saving
                         if (prototype.equals (e.getPrototypeFile ()))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for (Enumeration enum = openPrototypes.elements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else if (ix == JOptionPane.YES_OPTION)
Editor e = (Editor) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (ix == JOptionPane.CANCEL_OPTION)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Prompts the user to save the prototype
                                                                                                                                                                                                                                                                                                                                                                                 public static void removeEditor (Editor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                e = (Editor) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                  openPrototypes.removeElement (e);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public boolean isOpenPrototypeSaved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           } // End of the class CAPSMainWindow
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ("Save changes to the prototype " +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (e.isSaveRequired ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    e.savePrototype ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (); enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      flag = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          break label;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 boolean flag = true;
                                                             return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   return flag;
                                                                                                                           return true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Editor e;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'saveRequired'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 label
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     () + "?"));
                                                                                                                                                                                                                JOptionPane.showMessageDialog (this, "No prototype is selected to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              root.setLabel (name.substring (0, name.length () - 5)); // the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Checks whether or not the current prototype file is already used by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // If this is a new
                                                                                                                                                                                                                                                                                                                                                                                                                                          JOptionPane.showMessageDialog (this, new String ("Prototype" +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // Disable debug messages
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                :
                                                                                                                                                     // No prototype is selected to
                                                                                                                                                                                                                                                                                                                                                                                 // Attempt to edit the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Greturn true if one of the open prototypes is the same as the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          " is already open.")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for (Enumeration enum = openPrototypes.elements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Editor e = new Editor (prototype, root, types);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             root = PsdlBuilder.buildPrototype (prototype);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Error Message"
                                                                                                                                                                                                                                                                                     "Error Message",
                       * Opens the graphics editor to edit a prototype.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  root = new Vertex (0, 0, null, false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             String name = prototype.getName ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DataTypes types = new DataTypes ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PsdlBuilder.disable_tracing ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     openPrototypes.addElement (e);
                                                                                                                                                                                                                                                                                                                                                                            else if (!isPrototypeChanged ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public boolean isPrototypeChanged ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         types.buildTypes (prototype);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       new Thread (e).start ();
                                                                                                                                                  if (prototype == null) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Prototype name is the same as
                                                                                       public void editPrototype
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Vertex root = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                 JOptionPane.ERROR_MESSAGE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JOptionPane.ERROR_MESSAGE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (root == null)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               prototype file.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              prototype.getName () +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 a PSDL Editor.
                                                                                                                                                                                                                                                                                                                                                                                                              same prototype
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    prototype
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            file name
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   current
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   **/
                                                                                                                                                                                                                                                    edit.",
```

204

```
System.out.println ("SW Base has not been implemented yet");
                          else if (e.getSource () == swBaseMenuItem) {
                                                                                                                                                                                                                                                   } // End of the class DatabasesMenu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        private JMenuItem designDBMenuItem = new JMenuItem ("Design Database");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Oparam e The action event that is created by selecting a menu item
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (e.getSource () == designDBMenuItem) {
   System.out.println ("Design DB has not been implemented yet");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          private JMenuItem swBaseMenuItem = new JMenuItem ("Software Base");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public class DatabasesMenu extends JMenu implements ActionListener
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                designDBMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                         * This class holds the 'Databases' menu items.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Action event handler for the menu events.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      swBaseMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public void actionPerformed(ActionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Initiates the 'Design Database' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Initiates the 'Software Base' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Register the action listeners
                                                                                                                                                                         import java.awt.event.ActionListener;
                                                                                                                                              import java.awt.event.ActionEvent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Constructor for this class.
                                                                                                                                                                                                                                                                                                                                                              * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          add (designDBMenuItem);
add (swBaseMenuItem);
                                                                                                             import javax.swing.JMenuItem;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public DatabasesMenu ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      super ("Databases");
                                                                    import javax.swing.JMenu;
package caps.CAPSMain;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             from this menu
                                                                                                                                                                                                                                                                                                                                                                                                       * @version
```

```
* Oparam e The action event that is created by selecting a menu item
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 System.out.println ("Ada Editor has not been implemented yet");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  System.out.println ("Interface Editor has not been implemented
                                                                                                                                                                                                                                      * Oparam f The parent class which has declared this menubar.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     requirementsMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         capsDefaultsMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else if (e.getSource () == interfaceMenuItem)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          interfaceMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              changeReqMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Action event handler for the menu events
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else if (e.getSource () == adaMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hwModelMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public void actionPerformed(ActionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         psdlMenuItem.addActionListener (this);
     * The main window which owns this menu.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          adaMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (e.getSource () == psdlMenuItem)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Register the action listeners
                                                                                                                                                                       * The constructor for this class
                                                                                                                                                                                                                                                                                                      public EditMenu (CAPSMainWindow f)
                                                                protected CAPSMainWindow owner;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (requirementsMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (capsDefaultsMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               owner.editPrototype ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (interfaceMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (changeReqMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (hwModelMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (psdlMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (adaMenuItem);
                                                                                                                                                                                                                                                                                                                                                                             super ("Edit");
                                                                                                                                                                                                                                                                                                                                                                                                                                              owner = f;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     from this menu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       private JMenuItem changeReqMenuItem = new JMenuItem ("Change Request");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          private JMenuItem capsDefaultsMenuItem = new JMenuItem ("HSI Defults");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               private JMenuItem hwModelMenuItem = new JMenuItem ("Hardware Model");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                private JMenuItem interfaceMenuItem = new JMenuItem ("Interface");
                                                                                                                                                                                                                                                                                                                                                                                                                                      public class EditMenu extends JMenu implements ActionListener (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             private JMenuItem psdlMenuItem = new JMenuItem ("PSDL");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       private JMenuItem requirementsMenuItem = new JMenuItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                private JMenuItem adaMenuItem = new JMenuItem ("Ada");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Initiates the 'Hardware Model' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Initiates the 'Change Request' event
                                                                                                                                                                                                                                                                   * This class holds the 'Edit' menu items.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Initiates the 'CAPS Defaults' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Initiates the 'Requirements' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Initiates the 'Interface' event
                                                                                                                                                                  import java.awt.event.ActionListener;
                                                                                                                               java.awt.event.ActionEvent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * Initiates the 'Ada' event
                                                                                                                                                                                                                                                                                                                                    * @author Ilker DURANLIOGLU
                                                                                                 javax.swing.JMenuItem;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Initiates the 'PSDL'
                                                        import javax.swing.JMenu;
package caps.CAPSMain;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ("Requirements");
                                                                                                                                                                                                                                                                                                                                                                          * @version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                **/
                                                                                                 mport
                                                                                                                               import
```

```
public class ExecSupportMenu extends JMenu implements ActionListener {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           private JMenuItem translateMenuItem = new JMenuItem ("Translate");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     private JMenuItem scheduleMenuItem = new JMenuItem ("Schedule");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          private JMenuItem compileMenuItem = new JMenuItem ("Compile");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        private JMenuItem executeMenuItem = new JMenuItem ("Execute");
                                                                                                                                                                                                                                                                                                                  * This class holds the 'Exec Support' menu items.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Initiates the 'Translate' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * Register the action listeners
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Initiates the 'Schedule' event
                                                                                                                                                          import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Initiates the 'Compile' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Initiates the 'Execute' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Constructor for this class.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 add (translateMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                               * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       add (scheduleMenuItem);
                                                                                                                import javax.swing.JMenuItem;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   super ("Exec Support");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           add (compileMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public ExecSupportMenu ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     add (executeMenuItem);
                                                                          import javax.swing.JMenu;
package caps.CAPSMain;
                                                                                                                                                                                                                                                                                                                                                                                                                                         * @version
                                else if (e.getSource () == requirementsMenuItem) {
   System.out.println ("Requirements Editor has not been implemented
                                                                                                                                                                                              else if (e.getSource () == changeReqMenuItem) {
    System.out.println ("Change Requirements has not been implemented
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   System.out.println ("Hardware Model has not been implemented
                                                                                                                                                                                                                                                                                                                                                                                            System.out.println ("CAPS Defaults has not been implemented
                                                                                                                                                                                                                                                                                                                                                     else if (e.getSource () == capsDefaultsMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   else if (e.getSource () == hwModelMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     } // End of the class EditMenu
```

translateMenuItem.addActionListener (this); scheduleMenuItem.addActionListener (this);

yet");

```
* Oparam owner The parent class which has declared this menubar.
                                                                                                                                                                                                                                 * Closes the caps main window and exits from the program.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * The main program that has declared this object
                                                                                                                                                                                                                                                                                                                                                                                                                                      class ExitCAPSMain extends WindowAdapter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * The constructor for this class.
                                                                               import java.awt.event.WindowAdapter;
import java.awt.event.WindowEvent;
                                                                                                                                                                                                                                                                                                                    * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CAPSMainWindow capsMain;
package caps.CAPSMain;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               capsMain = caps;
                                                                                                                                                                                                                                                                                                                                                          * @version
                                                                                                                                                                                                                                                                       * Oparam e The action event that is created by selecting a menu item
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (e.getSource () == translateMenuItem) {
    System.out.println ("Translate has not been implemented yet");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  System.out.println ("Schedule has not been implemented yet");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    System.out.println ("Compile has not been implemented yet");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   System.out.println ("Execute has not been implemented yet");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else if (e.getSource () == compileMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (e.getSource () == executeMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else if (e.getSource () == scheduleMenuItem)
                               executeMenuItem.addActionListener (this);
                                                                                                                                                                                              * Action event handler for the menu events
compileMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                          public void actionPerformed(ActionEvent e)
                                                                                                                                                                                                                                                                                                                 from this menu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               208
```

```
public ExitCAPSMain (CAPSMainWindow caps)
{
    capsMain = caps;
}
/**
    * Window event handler for the menu events.
    * @param e The window event that is created when the program close icon is pressed.
    */
    public void windowClosing(WindowEvent e)
    {
        // Exit the program if the prototypes are saved if (capsMain.isOpenPrototypeSaved ())
        System.exit (0);
}
// End of the class ExitCapsMain
```

} // End of the class ExecSupportMenu

```
private JMenuItem commitWorkMenuItem = new JMenuItem ("Commit Work");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public class PrototypeMenu extends JMenu implements ActionListener
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   private JMenuItem openMenuItem = new JMenuItem ("Open");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   private JMenuItem newMenuItem = new JMenuItem ("New");
                                                                                                                                                                                                                                                                                                                                                        * This class holds the 'Prototype' menu items.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Initiates the 'Retrieve From DDB' event
                                                                                                     import javax.swing.filechooser.FileSystemView;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Initiates the 'Commit Work' event
                                                                                                                                                                          import java.awt.event.ActionListener;
import java.io.File;
                                                                                                                                             import java.awt.event.ActionEvent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Initiates the 'Open' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Initiates the 'New' event
                                                                                                                                                                                                                                                                                                                                                                                                                                * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                     import java.util.Vector;
package caps.CAPSMain;
                                                                     import javax.swing.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * @version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Gparam e The action event that is created by selecting a menu item
                                                                                                                                                                                                                                                                                                                                                                                                                                public class HelpMenu extends JMenu implements ActionListener (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Action event handler for the menu events.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public void actionPerformed(ActionEvent e)
                                                                                                                                                                                                                                                     * This class implements the 'Help' menu.
                                                                                                           import java.awt.event.ActionListener;
import java.awt.event.ActionEvent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Constructor for this class.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         } // End of the class HelpMenu
                                                                                                                                                                                                                                                                                                                           * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // Not implemented yet
                                                                              import javax.swing.JMenu;
     package caps. CAPSMain;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public HelpMenu ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      super ("Help");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                from this menu
                                                                                                                                                                                                                                                                                                                                                        * @version
```

```
/**
 * Initiates the 'Retrieve From DDB' event
 */
private JMenuItem retrieveMenuItem = new JMenuItem ("Retrieve From DDB");

/**
 * Initiates the 'Quit' event
 */
private JMenuItem quitMenuItem = new JMenuItem ("Quit");

/**
 * The main window which owns this menu.

protected CAPSMainWindow ownerWindow;

/**

* Constructor for this class.

* @param owner The main window which has created this menu.

* @param owner The main window which has created this menu.
```

```
ownerWindow.setPrototype (file);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           System.out.println (ex);
                                                                                                                                                                                                                                                                                                protoDir = new File (protoHome);
                                                                                                                                                                                                                                                                                                                                                                                                                                          protoDir = new File (protoHome);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         version number with the prototype name",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              file.createNewFile ();
  public void processNewMenuItem ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (!protoDir.exists ())
  protoDir.mkdir ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         file.delete ();
                                                                                                                                                                                                                                                                                                                          if (!protoDir.exists ())
                                                                                                                                                 if (protoHome == null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (file.exists ()) {
                                                                                                                                                                                                                                                                                                                                                      protoDir.mkdir ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JOptionPane.PLAIN_MESSAGE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOptionPane.ERROR_MESSAGE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (proto == null)
                                                                                                                                                                                                                                   ().getHomeDirectory ();
                                                                                                                     File protoDir;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (File.separator));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  overwrite it ?");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            proto.length ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         File.separator +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return;
                                                                                                                                                                                                                                                                                                                                                                                                              else (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   else
                                                                                                                                                                               argument
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Handles the event which is caused by selecting the 'New' menu item.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * @param e The action event that is created by selecting a menu item
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              System.out.println ("Commit Work has not yet been implemented");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       System.out.println ("Retrieve has not yet been implemented");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // Exit the program if all of the prototypes are saved.
if (ownerWindow.isOpenPrototypeSaved ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    else if (e.getSource () == commitWorkMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                commitWorkMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         else if (e.getSource () == retrieveMenuItem)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            retrieveMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else if (e.getSource () == quitMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Action event handler for the menu events.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  == openMenuItem)
public PrototypeMenu (CAPSMainWindow owner)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        quitMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      openMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                          newMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public void actionPerformed(ActionEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (e.getSource () == newMenuItem)
                                                                                                                                                                                                                                                                                                                                                                             * Register the action listeners
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              processOpenMenuItem ();
                                                                                                                                                                                                                                 (commitWorkMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          processNewMenuItem ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else if (e.getSource ()
                                                                                                                                                                                                                                                               (retrieveMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    System.exit (0);
                                                                                                              ownerWindow = owner;
                                                     super ("Prototype");
                                                                                                                                                                                                                                                                                           add (quitMenuItem);
                                                                                                                                                                                                       (openMenuItem);
                                                                                                                                                                           (newMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           from this menu
                                                                                                                                                                                                                                                               add
                                                                                                                                                                                                                                   add
                                                                                                                                                                                                    add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         210
```

```
String version = proto.substring (proto.indexOf (File.separator),
                                                                                                                                       // If it is not set as a command line
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Do you want to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      JOptionPane.showMessageDialog (ownerWindow, "Please enter the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   int selected = JOptionPane.showConfirmDialog (ownerWindow,
                                                                                                                                                                                                                                                                                                                      protoHome = new String (homeDir + File.separator + ".caps");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       File file = new File (protoHome + File.separator + proto
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Create new prototype : ", "New",
                                              String protoHome = System.getProperty ("PROTOTYPEHOME");
// The system property for the home prototype directory.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         String proto = JOptionPane.showInputDialog (ownerWindow
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Error Message"
                                                                                                                                                                                                                         File homeDir = FileSystemView.getFileSystemView
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            String name = proto.substring (0, proto.indexOf
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   else if (proto.indexOf (File.separator) == -1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (selected == JOptionPane.YES_OPTION)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    name + ".psdl");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             catch (java.io.IOException ex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Selected prototype file already exists.\n" +
```

```
prototypeNames.addElement (protoName.concat (File.separator
subDirs [jx].getName ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                selectedDir.getParentFile ().getName ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOptionPane.showMessageDialog (ownerWindow, "The selected
                                                                                                                                                                                                                                                                                                                                                                        "Open", JOptionPane.INFORMATION_MESSAGE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            File selectedDir = new File (protoHome + File.separator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Error Message",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              File file = new File (selectedDir.getAbsolutePath ()
                                                                                                                                                                                                                                                                  Object [] protos = prototypeNames.toArray ();
String selected = (String) JOptionPane.showInputDialog
dow, "Select a protovpe : ",
                                                         for (int jx = 0; jx < subDirs.length; <math>jx++) {
                        File subDirs [] = dirs [ix].listFiles ();
protoName = dirs [ix].getName ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ownerWindow.setPrototype (file);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        } // End of the class PrototypeMenu
                                                                                                                                                                                                                                                                                                                                          (ownerWindow, "Select a protoype :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (selected != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (!file.exists ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 prototype file cannot be opened"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JOptionPane.ERROR_MESSAGE);
                                                                                                                                                                                                                                                                                                                                                                                                         null, protos, protos [0]);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               File.separator +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 + ".psdl");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                selected);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JOptionPane.showMessageDialog (ownerWindow, "No prototype is is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (protoHome == null) { // If it is not set as a command line
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * Handles the event which is caused by selecting the 'Open' menu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protoHome = new String (homeDir + File.separator + ".caps");
protoDir = new File (protoHome);
                                                                                                                           File dir = file.getParentFile ().getParentFile ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              String protoHome = System.getProperty ("PROTOTYPEHOME");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Error Message",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     File homeDir = FileSystemView.getFileSystemView
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             for (int ix = 0; ix < dirs.length; ix++) {
                                                                                                                                                                                                File vers = file.getParentFile ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Vector prototypeNames = new Vector (0, 2);
                                                                                                                                                                                                                                                                  file.createNewFile ();
} catch (java.io.IOException ex)
                                                                                                                                                                                                                                                                                                                                                                                                            ownerWindow.setPrototype (file);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              File [] dirs = protoDir.listFiles ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protoDir = new File (protoHome);
                                                                                                                                                                                                                                                                                                                                 System.out.println (ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public void processOpenMenuItem ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (!protoDir.exists ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (!protoDir.exists ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protoDir.mkdir ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protoDir.mkdir ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (dirs.length == 0) {
                                                                                                                                                                                                                                    vers.mkdir ();
                                                                                                                                                                  dir.mkdir ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  String protoName = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JOptionPane.ERROR_MESSAGE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ().getHomeDirectory ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  File protoDir;
                                                               else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        found to open",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          argument
```

```
* Gets the label from the DataFlowComponent and creates a TextLayout
                                                                                                                                                                                public abstract boolean containsClickedPoint (int xLoc, int yLoc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     labelShape = new TextLayout (dfc.getLabel (), dfc.getlFont (),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           labelShape_getBounds ().getHeight () / 2;
r2D.setRect (x, y, r2D.getWidth (), r2D.getHeight ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     int x = dfc.getX () + dfc.getLabelXOffset () - (int)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              int y = dfc.getY () + dfc.getLabelYOffset () - (int)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * @return the bounding rectangle of the label shape.
                                                                                                          * This abstract method is implemented in subclasses.
                                                                                                                                                                                                                                                                                        * This abstract method is implemented in subclasses.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * This abstract method is implemented in subclasses.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * This abstract method is implemented in subclasses.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Returns the bounding rectangle of the label shape.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * @param g2D the graphics context of the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rectangle2D r2D = labelShape.getBounds ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public void setLabelShape (Graphics2D g2D)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public Rectangle2D getLabelShapeBounds ()
                                                                                                                                                                                                                                                                                                                                                                public abstract Vector getHandles ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           labelShape.getBounds ().getWidth () / 2;
  public abstract Shape getShape ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public abstract void delete ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public abstract void update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g2D.getFontRenderContext ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        shape for the label.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      return r2D;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * The constructor is protected so it cannot be instantiated directly.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * param d the DataFlowComponent that is associated with this object.
                                                                                                                                                                                                                                                                                                                                                       * This is an abstract super class of EdgePath and DisplayVertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * The DataFlowComponent that this object associates with.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * This abstract method is implemented in subclasses.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protected DisplayComponent (DataFlowComponent d)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * The shape of the label of the component,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * The shape of the met of the component .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public abstract class DisplayComponent {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public static final int HANDLESIZE =
                                                                                                                                                                                                                  import caps.Psdl.DataFlowComponent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protected DataFlowComponent dfc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * The size of the Handles.
                                                                                                                                                                                                                                                                                                                                                                                                                          * @author Ilker DURANLIOGLU
                                                                                                                                                                          import javax.swing.JLabel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TextLayout labelShape;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           labelShape = null;
                                                                                                                                                                                                                                                  import java.util.Vector;
                                                                                                  java.awt.font.*;
                                                                                                                                          java.awt.geom.*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TextLayout metShape;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                metShape = null;
package caps.Display;
                                                                        import java.awt. *;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        dfc = d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ' @version
                                                                                                        import
                                                                                                                                          import
```

```
* Returns the DataFlowComponent that is associated with this object.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Gets the location of the met (or latency) shape and draws it into
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ' Greturn the DataFlowComponent that is associated with this object.
   * Returns the bounding rectangle of the met (or latency) shape.
                                                                                        * Greturn the bounding rectangle of the met (or latency) shape.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 r2D.setRect (x, y, r2D.getWidth (), r2D.getHeight ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       int x = dfc.getX () + dfc.getMetXOffset () - (int)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            int y = dfc.getY () + dfc.getMetYOffset () + (int)
                                                                                                                                                                                                                                                                                                 int x = dfc.getX () + dfc.getMetXOffset () - (int)
                                                                                                                                                                                                                                                                                                                                                                                         int y = dfc.getY () + dfc.getMetYOffset () - (int)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * @param g2D the graphics context of the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public DataFlowComponent getDataFlowComponent
                                                                                                                                                                                                                                                                 Rectangle2D r2D = metShape.getBounds ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public void drawMetShape (Graphics2D g2D)
                                                                                                                                                                            public Rectangle2D getMetShapeBounds ()
                                                                                                                                                                                                                                                                                                                                                                                                                                       metShape.getBounds ().getHeight () / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  metShape.getBounds ().getHeight () / 2;
                                                                                                                                                                                                                                                                                                                                                  metShape.getBounds ().getWidth () / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              metShape.getBounds ().getWidth () / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    } // End of the class DisplayComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      metShape.draw (g2D, x, y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (dfc.getMet () != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return r2D;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return dfc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the DrawPanel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          **/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Creates a vector that holds the handles of a string (met or label).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * Gets the met (or latency) from the DataFlowComponent and creates a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     v.add (new Rectangle2D.Double (r2D.getMaxX () - i, r2D.getMinY ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      v.add (new Rectangle2D.Double (r2D.getMinX () - i, r2D.getMaxY ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 v.add (new Rectangle2D.Double (r2D.getMaxX () - i, r2D.getMaxY ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                v.add (new Rectangle2D.Double (r2D.getMinX () - i, r2D.getMinY ()
* Gets the location of the label shape and draws it into the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (dfc.getMet () != null) // It may not have an met
metShape = new TextLayout (dfc.getMet ().toString ().
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 metShape = new TextLayout (" ", dfc.getMetlFont (),
                                                                                                                                                                                                                                                                                                                                                                                         int y = dfc.getY () + dfc.getLabelYOffset () + (int)
                                                                                                                                                                                                                                                                                                        int x = dfc.getX () + dfc.getLabelXOffset () - (int)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Greturn returns the Vector that holds the handles.
                                                                                                                           * @param g2D the graphics context of the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * @param g2D the graphics context of the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * @param r2D the bounding rectangle of the string
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public Vector getStringHandles (Rectangle2D r2D)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     dfc.getMetlFont (), g2D.getFontRenderContext ());
                                                                                                                                                                                                                public void drawLabelShape (Graphics2D g2D)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public void setMetShape (Graphics2D g2D)
                                                                                                                                                                                                                                                                                                                                                                                                                                       labelShape.getBounds ().getHeight () / 2;
                                                                                                                                                                                                                                                                                                                                              labelShape.getBounds ().getWidth () / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    labelShape.draw (g2D, x, y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Vector v = new Vector ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g2D.getFontRenderContext ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         = HANDLESIZE / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TextLayout shape for the met.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              i, HANDLESIZE, HANDLESIZE));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  i, HANDLESIZE, HANDLESIZE));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   i, HANDLESIZE, HANDLESIZE));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            i, HANDLESIZE, HANDLESIZE));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         int i
                                             DrawPanel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          **/
```

```
* Always returns false since the shape is not displayed in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Returns the vector that contains the handles of the shape.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Deletes the external that is associated with this object.
                                                                                                                                                                                                                                                                                                                                                                                                       public boolean containsClickedPoint (int xLoc, int yLoc)
                                                                                                                                                                                                                                                                              * @param xLoc the x location of the clicked point.
* @param yLoc the y location of the clicked point.
* @return false.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Returns the shape that represents the External.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Greturn the shape that represents the External.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     } // End of the class DisplayExternal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Vector v = new Vector ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Greturn an empty Vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public Vector getHandles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public Shape getShape ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return (Shape) shape;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              external.delete ();
public void update ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public void delete ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               external = null;
                                                                 setLocation ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             shape = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   return v;
                                                                                                                                                                                                                       DrawPanel.
                                                                                                                                                           **/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           shape = new Rectangle2D.Double (e.getX (), e.getY (), 0.5, 0.5);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     shape.setFrame (x, y, shape.getWidth (), shape.getHeight ());
                                                                                                                                                                                                                                                                            * An instance of this class is created when external streams are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * param e the External that is associated with this object.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * The External object that is associated with this object.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Updates the location and the width of this shape.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Sets the location of this shape on the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                public class DisplayExternal extends DisplayComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protected Rectangle2D.Double shape;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public DisplayExternal (External e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * The constructor for this class
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            double x = external.getX ();
double y = external.getY ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * The shape of the External.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protected External external;
                                                                                                                                                                                                                                                                                                                                                                           * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public void setLocation ()
                                                                                                                                                                                  import java.util.Vector;
                                                       import java.awt.geom.*;
                                                                                       import java.awt.*;
import java.awt.font.*;
package caps.Display;
                                                                                                                                                        import caps.Psdl.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               external = e;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    super (e);
                                                                                                                                                                                                                                                                                                                                                                                                    * @version
                                                                                                                                                                                                                                                                                                               created.
```

```
shape.setFrame (vertex.getX () - shape.getWidth () / 2, vertex.getY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ,
,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Checks whether the bounding box of the shape contains the the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        v.add (new Rectangle2D.Double (s.getMinX () - i, s.getMinY ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    v.add (new Rectangle2D.Double (s.getMaxX () - i, s.getMinY ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (new Rectangle2D.Double (s.getMinX () - i, s.getMaxY ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * @param xLoc the x location of the clicked point.
* @param yLoc the y location of the clicked point.
* @return true if the bounding box contains the clicked point.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Greturn the vector that contains the handles of the shape
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Returns the vector that contains the handles of the shape
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          return getShape ().contains (new Point (xLoc, yLoc));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public boolean containsClickedPoint (int xLoc, int yLoc)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RectangularShape s = (RectangularShape) getShape ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Updates the location and the width of this shape.
                                                                                                                                                                                                                                               double height = vertex.getHeight ();
                                                                                                                                                                                                               double width = vertex.getWidth ()
                                                                                                                                                                                                                                                                                                                                                        width, height);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  location where the mouse is clicked.
                                                                * Sets the width of this shape.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Vector v = new Vector ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public Vector getHandles ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           int i = HANDLESIZE / 2;
                                                                                                                                                                                                                                                                                                                        () - shape.getHeight () / 2,
                                                                                                                                         public void setWidth ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HANDLESIZE, HANDLESIZE));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HANDLESIZE));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HANDLESIZE, HANDLESIZE));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public void update ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                setLocation ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      setWidth ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HANDLESIZE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          v.add
                                                                                                                                                                                                                                                                                                                     \star This class holds a shape for its associated Vertex. 
 \star It can either be a rectangle for terminators or it can be a circle
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           double x = vertex.getX () - shape.getWidth () / 2;
double y = vertex.getY () - shape.getHeight () / 2;
shape.setFrame (x, y, shape.getWidth (), shape.getHeight ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // x and y represent the upper left corner of the shape
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * param v the Vertex that is associated with this object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Sets the location of this shape on the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * The Vertex that is associated with this object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public class DisplayVertex extends DisplayComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * The constructor for this class
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protected RectangularShape shape;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public DisplayVertex (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * The shape of the Vertex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public void setLocation ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protected Vertex vertex
                                                                                                                                                                                                               import java.util.Vector;
                                                                                                                                      import java.awt.font.*;
                                                                     java.awt.geom.*;
                                                                                                                                                                                                                                                                                                                                                                                                * for the operators.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               setLocation ();
package caps.Display;
                                                                                                                                                                            import caps.Psdl.*;
                                                                                                        import java.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      setShape ();
setWidth ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         vertex = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   super (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * @version
                                                                        import
```

```
shape.getWidth () - 1.0f,
  * The shape that is returned will be painted with the color of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    shape.getWidth () - 10,
                                                                                                                                                                                                                                                                                                    return (Shape) new Rectangle2D.Double (shape.getX () + 1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      shape.getWidth () - 10,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (vertex.isLeaf ())
    return (Shape) new Ellipse2D.Double (shape.getX () + 1f,
shape.getY () + 1f,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            shape.getWidth () - 2f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return (Shape) new Ellipse2D.Double (shape.getX () + 5, shape.getY () + 5,
                                                                                                                                                                                                                                                                                                                                                                                                                                                   return (Shape) new Rectangle2D.Double (shape.getX () +
                                                                                        * Greturn a shape that is slightly smaller than the shape of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Deletes the vertex that is associated with this object.
                                                                                                                                                                                                                                         if (vertex.isTerminator ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          } // End of the class DisplayVertex
                                                                                                                                                                                public Shape getPaintedShape ()
                                                                                                                                                                                                                                                                   if (vertex.isLeaf ())
                                                                                                                                                                                                                                                                                                                                                                                          shape.getHeight () - 1.0f);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           shape.getHeight () - 10);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              shape.getHeight () - 10);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               shape.getHeight () - 2f);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public void delete ()
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 vertex.delete ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           vertex = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          shape = null;
                                                                                                                                                                                                                                                                                                                            shape.getY () + 1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           shape.getY () + 5,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else {
                                 Vertex.
                                                                                                                           object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * This method is called if the Vertex is composite. It calculates and
                                                                                                                                                                         * Sets the shape of this object to a circle if the associated Vertex
v.add (new Rectangle2D.Double (s.getMaxX () - i, s.getMaxY () - i,
HANDLESIZE, HANDLESIZE));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Returns a shape that is slightly smaller than the shape of this
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          shape.getWidth () - 8,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return (Shape) new Rectangle2D.Double (shape.getX () + 4,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       shape.getWidth ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          return (Shape) new Ellipse2D.Double (shape.getX () + 4,
                                                                                                                                                                                                                                    * or sets it to a rectangle if the Vertex is a Terminator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Greturn the inner shape for the composite Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Returns the shape that represents the Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Greturn the shape that represents the Vertex.
                                                                                                                                                                                                                                                                                                                                                                                        shape = new Rectangle2D.Double ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                 shape = new Ellipse2D.Double ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (vertex.isTerminator ())
                                                                                                                                                                                                                                                                                                                                                         if (vertex.isTerminator ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public Shape getInnerShape ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * a smaller inner shape.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return (Shape) shape;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public Shape getShape ()
                                                                                                                                                                                                                                                                                             public void setShape ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  shape.getHeight () - 8);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               shape.getHeight () - 8);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        shape.getY () + 4,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         shape.getY () + 4,
                                                           return v;
                                                                                                                                                                                                          is an operator
```

```
for (Enumeration enum = points.elements ();enum.hasMoreElements ();
                                                                                                                                                                                                                                                                                                                                    Point p = (Point) enum.nextElement (); if (p != points.firstElement () && p != points.lastElement ())
                                                                                                                                                                                                                                                                   for (Enumeration enum = points.elements (); enum.hasMoreElements
                                                                                                                                                                                                                                                                                                                                                                                                                                   if ((Math.abs (p.x - xLoc) <= HITDISTANCE) && (Math.abs (p.y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Updates the shape by polling values from the associated Edge
                                                                * Greturn true if the bounding box contains the clicked point.
                                                                                                                                                                                                                                                                                                                                                                                             // Waste the other point
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 edge.setSelectedHandleIndex (points.indexOf (p));
                                                                                                                                 public boolean containsClickedPoint (int xLoc, int yLoc)
* @param xLoc the x location of the clicked point. * @param yLoc the y location of the clicked point.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (pl.equals (points.lastElement ())) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       p2 = (Point) points.lastElement ();
p1 = (Point) points.elementAt (points.size ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (p1.equals (points.firstElement ()))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            shape.quadTo (p1.x, p1.y, p2.x, p2.y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        shape.moveTo (p1.x, p1.y);
p2 = (Point) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             p2 = (Point) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       p1 = (Point) enum.nextElement ();
                                                                                                                                                                                                                                   Vector points = edge.getPoints ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Vector points = edge.getPoints ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         edge.correctEndingPoints ();
                                                                                                                                                                                                                                                                                                                                                                                                       enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                buildArrowHead (p2, p1);
                                                                                                                                                                                             int HITDISTANCE = 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    return true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public void update ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        yLoc) <= HITDISTANCE))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Point p2;
shape.reset ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Point p1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       object.
                                                                                                                                                                                                                                                                                                      );;
();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                * Checks whether the bounding box of the shape contains the the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * param e the Edge that is associated with this object.
                                                                                                                                                                                                                                                                                                      * It contains a GeneralPath shape to represent the Edge.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * The Edge that is associated with this object
                                                                                                                                                                                                                                                                   * This class represents an Edge on the DrawPanel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Greturn the shape that represents the Edge.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Returns the shape that represents the Edge.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public class EdgePath extends DisplayComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           The constructor for this class
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                location where the mouse is clicked.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            shape = new GeneralPath ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protected GeneralPath shape
                                                                                                                                                                                                                                                                                                                                                                    * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * The shape of the Edge.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public Shape getShape ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return (Shape) shape;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public EdgePath (Edge
                                                                                                                                                                       import java.awt.geom.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protected Edge edge;
                                                                      import caps.Psdl.Edge;
  package caps.Display;
                                                                                                    import java.util.*;
                                                                                                                                 java.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              super (e);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              edge = e;
                                                                                                                                                                                                                                                                                                                                                                                                       * @version
                                                                                                                                    import
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             217
```

```
p = (Point) enum.nextElement ();
if (p != points.firstElement () && p != points.lastElement ())
                                                                                         v.add (new Rectangle2D.Double (p.x - i, p.y - i, HANDLESIZE,
                                                              // Waste the other point
                                                                                                                                                                                                                                                                                                       * Deletes the Edge that is associated with this object.
                                                              enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   } // End of the class EdgePath
                                                                                                                                                                                                                                                                                                                                                                     public void delete ()
                                                                                                                                                                                                                                                                                                                                                                                                                                   edge.delete ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            shape = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                edge = null;
                                                                                                                                                                                     return v;
                                                                                                                         HANDLESIZE));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            angle = Math.atan ((double) (last.y - end.y) / (double) (last.x
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for (Enumeration enum = points.elements (); enum.hasMoreElements
                                                                                                                  * @param last the point before the ending point of the stream.
                                                                                                                                                                                                                                                                                                                                                                     double halfarrowAngle = ARROWANGLE / 2.0 * Math.PI / 180.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Returns the vector that contains the handles of the shape.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Greturn the vector that contains the handles of the shape
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       last.y - (int) (Math.sin(tempAngle) *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            last.y - (int) (Math.sin(tempAngle) *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tempAngle = angle + halfArrowAngle;
shape.lineTo (last.x - (int) (Math.cos (tempAngle)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   shape.lineTo (last.x - (int) (Math.cos (tempAngle)
                                                                                                                                                                                                           public void buildArrowHead (Point last, Point end)
                                                                                                                                               * @param end the last pointof the stream
                                                         * Creates an arrow head for the stream.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tempAngle = angle - halfArrowAngle;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Vector points = edge.getPoints ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       angle = 3.0 * Math.PI / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            shape.lineTo (last.x, last.y);
                                                                                                                                                                                                                                                                                                         double ARROWSIDELENGTH = 15.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     angle = Math.PI + angle;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       angle = Math.PI / 2.0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Vector v = new Vector ();
                                                                                                                                                                                                                                                                         double ARROWANGLE = 25.0;
                                                                                                                                                                                                                                                                                                                                  double angle, tempAngle;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public Vector getHandles ()
{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Point p;
int i = HANDLESIZE / 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                if (last.x == end.x) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (last.x < end.x)
                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (last.y > end.y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ARROWSIDELENGTH));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ARROWSIDELENGTH));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ARROWSIDELENGTH),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ARROWSIDELENGTH),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              end.x));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                )
()
()
```

```
private final Cursor HAND_CURSOR = new Cursor (Cursor.HAND_CURSOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             private final Cursor MOVE_CURSOR = new Cursor (Cursor.MOVE_CURSOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public class DrawPanel extends JPanel implements MouseListener,
                                                                                                                                                                                                                                                                                                                                                                                                                  The drawpanel is the place where the prototypes are
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        private final Cursor DEFAULT_CURSOR = new Cursor

    The constant which specifies a terminator

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * The constant which specifies an operator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * The constant which specifies a stream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * The constant height of the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * The constant width of the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public static final int WIDTH = 1024;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public static final int HEIGHT = 768;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public final static int OPERATOR =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public final static int TERMINATOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MouseMotionListener, ActionListener {

    * Gauthor Ilker DURANLIOGLU

package caps.GraphEditor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (Cursor.DEFAULT_CURSOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                    drawn on the screen.
                                                                                                                                                                                                            java.awt.print.*;
                                                                                                                                                                       java.awt.event.*
                                                                                                                                      java.awt.geom.*;
                                                                                                                                                                                                                                                                                                              import caps.Display.*;
                                                                     javax.swing.*;
                                                                                                                                                                                                                                          java.util.*;
                                                                                                                                                                                                                                                                               import caps.Psdl.*;
                                                                                                       ava.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           @version
                                                                                                                                                                                                                                             import
                                                                     import
                                                                                                                                                                                                            import
                                                                                                       import
                                                                                                                                      import
                                                                                                                                                                          import
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Magenta", "Maroon", "Medium aqua marine", "Medium blue", "Medium
                                                                                                                                   public static String COLOR_NAMES [] = { "Aqua marine", "Black", "Blue",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public static int RGB_VALUES [] = (7396243, 0, 255, 10444703, 10889770,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   16720896, 14381275,
9419919, 12357519, 15379946, 16711680, 7291458, 2330216, 9333539,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Pale green", "Pink", "Plum",
"Red", "Salmon", "Sea green", "Sienna", "Sky blue", "Slate blue",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8323327, 8388352, 7396315, 14381203, 3092303, 2302862, 16744192,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11053224, 9408445, 3329330, 16711935, 9315179, 3329433, 3289805,
                                                                                                                                                                                                                                                                                                                                                                                                               "Indian red", "Khaki", "Light blue", "Light grey", "Light steel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Medium slate blue", "Medium spring green", "Medium turquoise",
                                                                                                                                                                                                      "Cadet blue", "Coral", "Cornflower blue", "Cyan", "Dark green",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Midnight blue", "Navy blue", "Orange", "Orange red", "Orchid",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Tan", "Thistle", "Turquoise", "Violet", "Violet red", "Wheat",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   4342383, 65535, 3100463, 5197615, 10040013, 7021454, 3100495, 5526612, 9315107, 2330147, 13467442, 14408560, 12632256, 65280, 9689968, 5123887,
                                                                                                                                                                                                                                                                                                                                            "Forest green", "Gold", "Golden rod", "Grey",
                                                                                                                                                                                                                                                                               "Dark orchid", "Dark slate blue", "Dark slate gray", "Dark
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2321294, 14390128, 14204888, 11397866, 5189455, 13382297,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      } // End of the class ColorConstants
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Yellow", "Yellow green" };
                                                                     public class ColorConstants (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Spring green", "Steel blue",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14211263, 16777215, 16776960,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Medium sea green"
        package caps.GraphEditor;
                                                                                                                                                                                                                                                                                                                                                                                      "Green yellow",
                                                                                                                                                                          "Blue violet", "Brown",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 32767, 65407,
                                                                                                                                                                                                                                                                                                                                                     "Fire brick",
                                                                                                                                                                                                                                                                                                              turquoise", "Dim gray"
                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Lime green",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10079282 };
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             10461023, 12638681,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Medium violet red"
                                                                                                                                                                                                                                                "Dark olive green"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6266783, 16744192,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                4353858,
```

public final static int STREAM = 3;

"White"

7377883,

9662683,

3316172,

orchid",

"Green",

blue",

```
// Panel does not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // Initially in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * @param frame The parent frame of this DrawPanel object.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IdListEditor idEditor = new IdListEditor (frame);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               setBorder (BorderFactory.createEtchedBorder ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    vPropertyPanel = new VertexProperties (frame);
ePropertyPanel = new EdgeProperties (frame);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // This is the root
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TextEditor editor = new TextEditor (frame);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public DrawPanel (Editor frame, Vertex root)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          displayComponentVector = new Vector ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     vPropertyPanel.setVisible (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ePropertyPanel.setVisible (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                * Constructs a new ToolBar object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          setAlignmentX (LEFT_ALIGNMENT);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        handlesVector = new Vector ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              setAlignmentY (TOP_ALIGNMENT);
                                                                                                                                     protected boolean selectAllMode;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            popupMenu = new Popup (this);
protected int currentComponent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               selectedComponent = null;
                                                                                                                                                                                                                                                                           protected Rectangle bounds;
                                                                                                                                                                                                                                                                                                                                               protected int currentColor;
                                                                 protected Popup popupMenu;
                                                                                                                                                                                                       protected Point prevPoint;
                                                                                                                                                                                                                                                                                                                                                                                                                 protected int currentFont,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              diagonalPoint = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               parentVertex = root;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           parentFrame = frame;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  currentEdge = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   selectMode = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          super ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             accept these
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 selectMode.
                                                                                                                                                                                                                                                                                                                                                                                                         * This vector holds the shapes that are drawn in the DrawPanel. * Each shape is redrawn in the paint method by polling them from this
                           * The value of this variable is true if the toolbar is in the select
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // The parent of the current
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ៧
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Current component is either an OPERATOR, or a TERMINATOR or
                                                                                                                                                                                                                                  * The frame which has created this DrawPanel object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * according to the selection from the toolbar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protected boolean IS_COLLECTING_POINTS = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protected DisplayComponent selectedComponent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protected boolean MOVING_COMPONENT = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protected VertexProperties vPropertyPanel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protected Vector displayComponentVector;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protected EdgeProperties ePropertyPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protected boolean MOVING_LABEL = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protected boolean MOVING_MET = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protected boolean MOVING_ALL = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protected boolean RESIZING = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protected boolean selectionDefault;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protected Point2D diagonalPoint;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protected EdgePath currentEdge;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protected Vector handlesVector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protected Vertex parentVertex;
                                                                                                                                   protected boolean selectMode;
                                                                                                                                                                                                                                                                                                      protected Editor parentFrame
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STREAM
```

```
if (dfc instanceof Vertex && !(((Vertex) dfc).isTerminator ()) &&
                                                                                                         (selectedComponent instanceof DisplayVertex && selectedComponent
                                                                                                                                                                                                                                                                setParentVertex ((Vertex) selectedComponent.getDataFlowComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DataFlowComponent dfc = (DataFlowComponent) enum.nextElement ();
DataFlowComponent dfc = selectedComponent.getDataFlowComponent ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else if (dfc instanceof Vertex && (((Vertex) dfc).isTerminator
                                                                                                                                                                                     //selectedComponent.getDataFlowComponent ().setAllowsChildren
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ((Edge) ep.getDataFlowComponent ()).correctLabelOffset ();
                                    if (dfc instanceof Vertex && ((Vertex) dfc).isTerminator ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DisplayVertex tr = new DisplayVertex ((Vertex) dfc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DisplayVertex op = new DisplayVertex ((Vertex) dfc);
                                                                  parentFrame.getToolBar ().setOperatorButton (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        parentFrame.getToolBar ().setOperatorButton (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                parentFrame.getToolBar ().setOperatorButton (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public void setParentVertex (Vertex v, Graphics2D g2D)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for (Enumeration enum = parentVertex.children ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EdgePath ep = new EdgePath ((Edge) dfc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         displayComponentVector.addElement (op);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        displayComponentVector.addElement (tr);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                displayComponentVector.removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g2D = (Graphics2D) getGraphics ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (dfc instanceof External)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public void changeLevel (Vertex parent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (dfc instanceof External))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  setParentVertex (parent, null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              op.setLabelShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tr.setLabelShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ep.setLabelShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  op.setMetShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tr.setMetShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ep.setMetShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (parent.isTerminator ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                  // Invoked from the treepanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setSelectMode (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            parentVertex = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (g2D == null)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    else {
                                                                                                                                                                                                                                                                                                 (), null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else
                                                                                                                                                      i = null
                                                                                                                                                                                                                               (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         339 (()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // If this is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sets the select mode to true or false. The panel is generally in the select mode unless another button is pressed in the toolbar.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Oparam mode true if the panel is going to be in the select mode.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // Register mouse events
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       setParentVertex ((Vertex) parentVertex.getParent (), null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setParentVertex ((Vertex) parentVertex.getRoot (), null);
                                                                                                                                                                                                                                                                                                                                                                                                                    (it is 5 - 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (selectMode == false && selectedComponent != null)
                                                                                                                                                                                                                                                                                                                                                                             // White; 61 because it is index
// Courier Plain 12 (it is 5 - 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      parentFrame.getToolBar ().setOperatorButton (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        parentFrame.getToolBar ().setOperatorButton (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Pending should do more things (erase handles, etc)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public void setSelectMode (boolean mode)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (parentVertex.isRoot () == false)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (parentVertex.isRoot () == false)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (selectedComponent == null)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    addMouseMotionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            selectedComponent = null;
                                             setCursor (DEFAULT_CURSOR);
                                                                                                                                                                                                                                  prevPoint = new Point ();
                                                                                                                                                          selectionDefault = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                addMouseListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void gotoParent ()
                                                                                                                     selectAllMode = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void decompose ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public void gotoRoot ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         not the root of this tree
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                eraseHandles ();
                                                                                                                                                                                                                                                                                                                                                                                currentColor = 61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       selectMode = mode;
                                                                                                                                                                                                                                                                                                                                                                                                                          currentFont = 4;
                                                                                                                                                                                                                                                                                                             bounds = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return;
```

```
// *** Maybe we don't need this
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Calls the paintComponent () method to draw the component to this
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // It will allow to place only one
                                                                                                                                                                                                                                                                                            for (Enumeration enum = displayComponentVector.elements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Vertex op = new Vertex (xLoc, yLoc, parentVertex, false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 op.setMetFontIndex (currentFont + 1);
parentFrame.getTreeFanel ().addNewDFC (op, parentVertex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Creates a new Operator and a new OperatorCircle object.
                                                                                                                                                                                                                                                                                                                                                                                                    (dc.getDataFlowComponent ().equals (dfc)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DisplayVertex opCircle = new DisplayVertex (op);
                                                                                                                                                                              public void setSelectedDFC (DataFlowComponent dfc)
                                                                                                                                                                                                                                                                                                                                                                       dc = (DisplayComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                System.out.println (selectedComponent);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Graphics2D g2D = (Graphics2D) getGraphics ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public void processOperator (int xLoc, int yLoc)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     displayComponentVector.addElement (opCircle);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               @param xLoc The x location of the component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * @param yLoc The y location of the component.
  public void setCurrentComponent (int component)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // ******* Pending drawlist ?? *******
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             handlesVector = dc.getHandles ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              op.setLabelFontIndex (currentFont + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      //System.out.println (selectMode);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 op.setColor (currentColor + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // ******* Pending drawlist ??
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      paint (getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               opCircle.setLabelShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                             selectedComponent = dc;
                                                                           currentComponent = component;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               opCircle.setMetShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (opcircle);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   setSelectMode (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (selectionDefault)
                                                                                                                                                                                                                                                            DisplayComponent dc;
                                                                                                                                                                                                                                                                                                                            enum.hasMoreElements ();)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     paintComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        component at a time
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  *****
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               panel.
                                                                                                                                                                                                                                                                                                                                                         else if ((Edge) dfc).getDestination () instanceof External) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //for (Enumeration e = handlesVector.elements (); e.hasMoreElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Sets the currentComponent variable to the specified argument.
                                                                                                                                                                           extern.setLabelShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       extern.setLabelShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                extern.setMetShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    extern.setMetShape ((Graphics2D) getGraphics ());
                                                                  if ((Edge) dfc).getSource () instanceof External) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void clearAllComponentsFromScreen (Graphics2D g2D)
                                                                                                  DisplayExternal extern = new DisplayExternal
                                                                                                                                                                                                                                                                                                                                                                                         DisplayExternal extern = new DisplayExterna.
                                                                                                                                                                                                                                                                                         displayComponentVector.addElement (extern);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             displayComponentVector.addElement (extern);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * @param component OPERATOR, TERMINATOR or STREAM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //Graphics2D g2D = (Graphics2D) getGraphics ();
                             displayComponentVector.addElement (ep);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         System.out.println ("Inside eraseHandles");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g2D.fill ((Shape) e.nextElement ());
                                                                                                                                                                                                                                                                                                                                                                                                                               ((External)((Edge) dfc).getDestination ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g2D = (Graphics2D) getGraphics ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   clearAllComponentsFromScreen (null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g2D.setColor (Color.white);
g2D.fillRect (0, 0, WIDTH, HEIGHT);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        clearAllComponentsFromScreen (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             handlesVector.removeAllElements ();
                                                                                                                               ((External)((Edge) dfc).getSource ());
                                                                                                                                                                                                                                                   // *** Maybe we don't need this *****
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // *** Maybe we don't need this *****
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g2D.setColor (Color.white);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public void eraseHandles ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     paint (getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           paint (g2D);
setSelectMode (true);
ep.update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (q2D == null)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ÷
```

* Creates a new Terminator and a new TerminatorRectangle object.

```
((Edge) currentEdge.getDataFlowComponent ()).addPoint (x, y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 *** //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // vertex-vertex or vertex-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // This is an external -> vertex stream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * @param component The component to be drawn into the panel
                                                                                                                                                                                                                             parentFrame.getToolBar ().enableSelectButton ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            System.out.println ("Building edge" + v.getLabel ());
                                                                                                                                                   displayComponentVector.addElement (currentEdge);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            extern.setLabelShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DisplayExternal extern = new DisplayExternal (ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 extern.setMetShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Paints the component into this panel by calling the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     External ex = new External (x, y, parentVertex);
((Edge) currentEdge.getDataFlowComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          displayComponentVector.addElement (extern);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Edge ed = new Edge (x, y, parentVertex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Edge ed = new Edge (x, y, parentVertex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ed.setLabelFontIndex (currentFont + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ex.setLabelFontIndex (currentFont + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ed.setLabelFontIndex (currentFont + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ed.setMetFontIndex (currentFont + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ex.setMetFontIndex (currentFont + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ed.setMetFontIndex (currentFont + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                  // collect the next point
                                                                                                              IS_COLLECTING_POINTS = false;
                                                                                                                                                                                                                                                                                                                                           paintComponent (currentEdge);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     currentEdge = new EdgePath (ed);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    currentEdge = new EdgePath (ed);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IS_COLLECTING_POINTS = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IS_COLLECTING_POINTS = true;
                                                                                                                                                                                                                                                                 setSelectMode (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         // First click
                                                                         currentEdge.update ();
                                                                                                                                                                                        if (selectionDefault)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  paintComponent (extern);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               don't need this *****
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              graphics2D.draw(Shape) method.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else if (v == null) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ex.addOutEdge (ed);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        v.addOutEdge (ed);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ed.setSource (ex);
                                       ()).correctLabelOffset ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ed.setSource (v);
                                                                                                                                                                                                                                                                                                                                                                                                                     else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Maybe we
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 external
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     **/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (dc instanceof DisplayVertex && dc.getShape ().contains (x,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ((Edge) currentEdge.getDataFlowComponent ()).addPoint (x, y);
                                                                                                                                                                                                                                                                                                                                                                                // It will allow to place only one
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ((Edge) currentEdge.getDataFlowComponent ()).setDestination
   * Calls the paintComponent () method to draw the component to this
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //if (dc instanceof DisplayVertex) { // *** Pending needs to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    System.out.println ("The destination is" + v.getLabel ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         v.addInEdge ((Edge) currentEdge.getDataFlowComponent ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   currentEdge.setLabelShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // **** Returns OKAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        currentEdge.setMetShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             parentFrame.getTreePanel ().addNewDFC (term, parentVertex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for (Enumeration enum = displayComponentVector.elements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Vertex term = new Vertex (xLoc, yLoc, parentVertex, true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // Second or more click
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DisplayVertex tRectangle = new DisplayVertex (term);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             parentFrame.getTreePanel ().addNewDFC ((Edge)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      v = (Vertex) dc.getDataFlowComponent ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public void processStream (int x, int y, int clicks)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // Found the destination
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          dc = (DisplayComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     displayComponentVector.addElement (tRectangle);
                                                                                                                                                                                                                                public void processTerminator (int xLoc, int yLoc)
                                                                                                                                             Gparam yLoc The y location of the component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    currentEdge.getDataFlowComponent (), parentVertex);
                                                                                                              @param xLoc The x location of the component.
                                                                                                                                                                                                                                                                                                         Graphics2D g2D = (Graphics2D) getGraphics ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  System.out.println ("Collecting points");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   term.setLabelFontIndex (currentFont + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        term.setMetFontIndex (currentFont + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 //System.out.println (v.getLabel ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           term.setColor (currentColor + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tRectangle.setLabelShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tRectangle.setMetShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (IS_COLLECTING_POINTS) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   paintComponent (tRectangle);
                                                                                                                                                                                                                                                                                                                                                                                setSelectMode (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       check if it is a stream ***
                                                                                                                                                                                                                                                                                                                                           if (selectionDefault)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DisplayComponent dc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (v != null) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Vertex v = null;
                                                                                                                                                                                                                                                                                                                                                                                                                        component at a time
                                          panel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (A)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    <u>}</u>
```

```
for (Enumeration e = handlesVector.elements (); e.hasMoreElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (!selectAllMode && isHoldingHandle (xPosition, yPosition)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Handles the event that occurs when a mouse button is clicked on
                                                                                                                                                                                                                 if ((selectMode && selectedComponent != null) || selectAllMode)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  selectedComponent.getShape ().getBounds2D ().contains
                                       g2D.draw (((DisplayVertex) dcp).getInnerShape ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Greturn Returns a new Dimension object initialized to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (selectedComponent instanceof DisplayVertex &&
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // Do nothing for the middle Button at the moment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else if (flags == MouseEvent.BUTTON1_MASK || flags
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Sets the size of the panel to WIDTH and HEIGHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        int yPosition = e.getY ();
int flags = e.getModifiers ();
prevPoint.setLocation (xPosition);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              System.out.println ("Holding Handle");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (diagonalPoint)) // Make sure it is not the label
                                                                                                                                                   ***** Pending
                                                                                                                                                                                                                                                                                                                                                        g2D.fill ((Shape) e.nextElement ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    return new Dimension (WIDTH, HEIGHT);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * @param e The MouseEvent that occurs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WIDTH and HEIGHT parameters
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public void mousePressed (MouseEvent e)
                                                                                                                                                                                                                                                                                                                      g2D.setColor (Color.gray);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public Dimension getPreferredSize
                                                                                                                                                   dcp.drawMetShape (g2D); //
                                                                                                        dcp.drawLabelShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         int xPosition = e.getX ();
        if (!dfc.isLeaf ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESIZING = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (e.isAltDown ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MouseEvent.BUTTON3_MASK)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                this panel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            **/
                                                                                                                                                                                                                                                                                       ) ((()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                * This method is called to repaint all the components when necessary.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ***** ¿ XHM *** //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // Pending need to change the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         မွ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (MOVING_LABEL && selectedComponent.getDataFlowComponent ()
                                                                                                                                                                                                        //g2D.fill (((DisplayVertex) component).getPaintedShape ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (dfc instanceof Edge && ((Edge) dfc).isStateStream ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DisplayComponent dcp = (DisplayComponent) e.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DataFlowComponent dfc = dcp.getDataFlowComponent ();
if (MOVING_COMPONENT || // *** PENDING Had to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g2D.fill (((DisplayVertex) dcp).getPaintedShape ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           g2D.setColor (new Color (ColorConstants.RGB_VALUES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  //System.out.println ("Inside paint method of drawPanel"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for (Enumeration e = displayComponentVector.elements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // and also label changes vs
                                                                                                                                          g2D.setColor (new Color (ColorConstants.RGB_VALUES
public void paintComponent (DisplayComponent component)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // int size = displayComponentVector.size ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g2D.setStroke (new BasicStroke (1.5f));
                                                                 Graphics2D g2D = (Graphics2D) getGraphics ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * @param g The graphics context of the panel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      g2D.setStroke (new BasicStroke (1f));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (dcp instanceof DisplayVertex) {
                                                                                                if (component instanceof DisplayVertex)
                                                                                                                                                                                                                                                                                                                                                                                                                       if (component instanceof DisplayVertex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g2D.setColor (Color.black);
                                                                                                                                                                                                                                             g2D.fill (component.getShape ());
                                                                                                                                                                                                                                                                                                                                                   g2D.draw (component.getShape ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g2D.draw (dcp.getShape ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g2D.draw (dcp.getShape ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       6
                                                                                                                                                                                                                                                                                                                                                                                                                                                           component.drawMetShape (g2D);
                                                                                                                                                                                                                                                                                                                                                                                       component.drawLabelShape (g2D);
                                                                                                                                                                                                                                                                                     g2D.setColor (Color.black);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             [((Vertex) dfc).getColor () - 1]));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Graphics2D g2D = (Graphics2D)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g2D.setColor (Color.black);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public void paint (Graphics g)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      update in & out edges
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           dcp.update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              e.hasMoreElements ();)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            instanceof External))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         selectedComponent);
                                                                                                                                                                            [currentColor]))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     color some
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      this to
```

```
// in the for loop
                                                                                                                                                     // I put it here
                                                                                        // Clicked on an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                parentFrame.getJMenuBar ().getMenu (3).getItem (2).setEnabled
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        parentFrame.getJMenuBar ().getMenu (1).getItem (4).setEnabled
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              parentFrame.getJMenuBar ().getMenu (2).getItem (0).setEnabled
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  e.getClickCount
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             parentFrame.getToolBar ().enableSelectButton ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           parentFrame.getToolBar ().enableSelectButton ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  processTerminator (xPosition, yPosition);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  processOperator (xPosition, yPosition);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                processStream (xPosition, yPosition,
                                                                                     if (selectedComponent != null && !flag) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          parentFrame.setSaveRequired (true);
                                                                                                                                                                                                                                                                                                                                  //System.out.println (selectedComponent);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          parentFrame.setSaveRequired (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             parentFrame.setSaveRequired (true);
                                                                                                                                                                                                                                                                                                                                                                                        else if (flags != MouseEvent.BUTTON3_MASK)
parentVertex.setAllowsChildren (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                implementation
                          setCursor (MOVE_CURSOR);
                                                                                                                                                                                                                                          setSelectAllMode (false);
                                                                                                                                                  selectedComponent = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                        switch (currentComponent) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (selectionDefault)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (selectionDefault)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (selectedComponent == null) {
                                                                                                                                                                                  not to call erasehandles everytime
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public void setMenuBarItems ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ()); // Pending same as chriss'
                                                                                                                                                                                                               eraseHandles ();
                                                                                                                                                                                                                                                                                                       setMenuBarItems ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     case TERMINATOR:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       case OPERATOR:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                case STREAM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          break;
if (flag)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // decompose
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // delete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // color
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          else {
                                                                                                                          empty area
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // This is more work can look at
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else if (dc.containsClickedPoint (xPosition, yPosition)) {
                                                                                                                                                                                                                                                                                                                                                                                                                          System.out.println (selectedComponent + " Moving_All");
MOVING_ALL = true;
                                                                                                                                                                                                                                          (selectAllMode && (dc.containsClickedPoint (xPosition,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // **** Pending calls the
                               // Just for
                                                                                                                                                     for (Enumeration enum = displayComponentVector.elements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else if (dc.getLabelShapeBounds ().contains (xPosition,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // **** Pending this is too
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // ***** Pending this is too
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else if (dc.getMetShapeBounds ().contains (xPosition,
                                                                                                                                                                                                                                                                                                       dc.getLabelShapeBounds ().contains (xPosition,
                                                                                                                                                                                                                                                                                                                                                                (dc.getMetShapeBounds ().contains (xPosition
                                                                                                                                                                                                             dc = (DisplayComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        System.out.println ("Inside the label");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      flag = true; // Clicked on a component
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        System.out.println ("Inside the met");
                             //System.out.println ("Select mode is on");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        System.out.println ("Yes, inside");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                handlesVector = dc.getStringHandles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                handlesVector = dc.getStringHandles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   handlesVector = dc.getHandles ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                paint (getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           paint (getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                selectedComponent = dc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          paint (getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                selectedComponent = dc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // If clicked an a label
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               selectedComponent =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             yPosition)) { // If clicked an an met
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          eraseHandles ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        eraseHandles ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          eraseHandles ();
                                                                                                                       boolean flag = false;
                                                                                        DisplayComponent dc;
  else if (selectMode) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       flag = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        flag = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        flag = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (dc.getLabelShapeBounds ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                a component
                                                                                                                                                                                    enum.hasMoreElements ();)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (dc.getMetShapeBounds ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          versions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           paint method twice here
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // **** PENDING ****
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                o
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        it in the older
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               yPosition)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // If clicked
                                                                                                                                                                                                                                                                                                                                                                                               yPosition))))
                                                                                                                                                                                                                                                                                                                                     yPosition) ||
                                                                                                                                                                                                                                                                        yPosition)
                                                             debugging
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          simple
```

```
((Edge) currentEdge.getDataFlowComponent ()).setDestination (ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ((Edge) currentEdge.getDataFlowComponent ()).addPoint (xPosition,
                                                                                                                                                                                                                                                                                                popupMenu.showPopupMenu (false, xPosition, yPosition); //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       External ex = new External (xPosition, yPosition, parentVertex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          *** //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   else if (flags == MouseEvent.BUTTON3_MASK && IS_COLLECTING_POINTS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ((Edge) currentEdge.getDataFlowComponent ()).correctLabelOffset
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          vPropertyPanel.setVertex ((Vertex) d.getDataFlowComponent ());
                                                                                                                                                                                        popupMenu.showPopupMenu (true, xPosition, yPosition);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ex.addInEdge ((Edge) currentEdge.getDataFlowComponent ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ePropertyPanel.setEdge ((Edge) d.getDataFlowComponent ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             currentEdge.getDataFlowComponent (), parentVertex);
currentEdge.setLabelShape ((Graphics2D) getGraphics ());
                                      !(selectedComponent.getDataFlowComponent () instanceof External)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    currentEdge.setMetShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          extern.setLabelShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ĝ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 parentFrame.getToolBar ().enableSelectButton ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DisplayExternal extern = new DisplayExternal (ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           extern.setMetShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       displayComponentVector.addElement (currentEdge);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  vPropertyPanel.setDisplayVertex ((DisplayVertex)
                                                                                                                                                    if (selectedComponent instanceof EdgePath)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            parentFrame.getTreePanel ().addNewDFC ((Edge)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         displayComponentVector.addElement (extern);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ePropertyPanel.setEdgePath ((EdgePath) d);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ਰੇ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public void showProperties (DisplayComponent
                                                                                                                                                                                                                                                                                                                                                                                                        showProperties (selectedComponent);
                                                                                                                 if (flags == MouseEvent.BUTTON3_MASK)
  if (selectedComponent != null &&
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               paintComponent (currentEdge);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IS_COLLECTING_POINTS = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (d instanceof DisplayVertex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // *** Pending may also be stream ***
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setSelectMode (true);
                                                                                                                                                                                                                                                                                                                                                                        else if (clickCount > 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   paintComponent (extern);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      currentEdge.update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     don't need this *****
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (selectionDefault)
                                                                             && !selectAllMode)
                                                                                                                                                                                                                         disables decompose
                                                                                                                                                                                                                                                                                                                                       enables decompose
                                                                                                                                                                                                                                                                     else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           yPosition);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Maybe we
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            :
:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Handles the event that occurs when the mouse enters into the panel.
                                                                                                                                                                                                                                                                                                                              parentFrame.getJMenuBar ().getMenu (2).getItem (0).setEnabled
                                                                                                                                                                            parentFrame.getJMenuBar ().getMenu (3).getItem (2).setEnabled
                                                                                                           parentFrame.getJMenuBar ().getMenu (2).getItem (0).setEnabled
                                                                                                                                                                                                                                                                                                                                                                                                        parentFrame.getJMenuBar ().getMenu (3).getItem (2).setEnabled
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Handles the event that occurs when a mouse button is pressed on
parentFrame.getJMenuBar ().getMenu (1).getItem (4).setEnabled
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Handles the event that occurs when the mouse exits the panel.
                                                                 if (selectedComponent instanceof EdgePath) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            //System.out.println ("MouseEntered");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          //System.out.println ("MouseClicked");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           //System.out.println ("MouseExited");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Oparam e The MouseEvent that occurs.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Aparam e The MouseEvent that occurs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  int clickCount = e.getClickCount ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * Gparam e The MouseEvent that occurs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public void mouseClicked (MouseEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public void mouseEntered (MouseEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public void mouseExited (MouseEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               flags = e.getModifiers ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           yPosition = e.getY ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 int xPosition = e.getX ();
                                                                                                                                                                                                                      // decombose
                                                                                                                                                                                                                                                                                                                                                                                                                                               // decompose
                                                                                                                                              (false); // color
                                   (true); // delete
                                                                                                                                                                                                                                                                                                                                                                        // color
                                                                                                                                                                                                                                                                                                else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              this panel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               int
                                                                                                                                                                                                                      (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                               (true);
                                                                                                                                                                                                                                                                                                                                                                        (true);
```

>

```
handlesVector.addAll (selectedComponent.getStringHandles
                                                                                                                                                                                                                 for (Enumeration enum = displayComponentVector.elements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             handlesVector.addAll (selectedComponent.getStringHandles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       r2D.setFrameFromDiagonal (new Point (xPosition, yPosition),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  handlesVector.addAll (selectedComponent.getHandles ());
                                                                                                                                                                                                                                                                                      selectedComponent = (DisplayComponent) enum.nextElement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              dfc.setLabelOffset (xPosition - prevPoint.x, yPosition
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ((External) dfc).setLocation (xPosition - prevPoint.x,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             dfc.setMetOffset (xPosition - prevPoint.x, yPosition
                                                                                                                                                                                                                                                                                                                                                               dfc = selectedComponent.getDataFlowComponent ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       handlesVector = selectedComponent.getStringHandles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  handlesVector = selectedComponent.getStringHandles
                                                                                                                                                                                                                                                                                                                                                                                               dfc.moveTo (xPosition - prevPoint.x, yPosition
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ((Vertex) dfc).setWidth ((int) r2D.getWidth ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nandlesVector = selectedComponent.getHandles ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            dfc).setY ((int) r2D.getCenterY ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ((Vertex) dfc).setX ((int) r2D.getCenterX ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Rectangle2D.Double r2D = (Rectangle2D.Double)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bounds = (Rectangle) bounds.createUnion
                                                                                                        bounds = (Rectangle) ((DisplayComponent)
                                     //System.out.println ("Moving all");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 System.out.println ("Now resizing");
                                                                     handlesVector.removeAllElements ();
(selectAllMode && (MOVING_ALL)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   selectedComponent.update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         selectedComponent.update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (dfc instanceof External) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (selectedComponent.getShape ().getBounds ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       selectedComponent.getShape ().getBounds2D ();
                                                                                                                                                                           .getShape ().getBounds ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (selectedComponent.getLabelShapeBounds ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        selectedComponent.update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (selectedComponent.getLabelShapeBounds ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (selectedComponent.getMetShapeBounds ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (selectedComponent.getMetShapeBounds ());
                                                                                                                                           displayComponentVector.elementAt (0))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          else if (MOVING_LABEL) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else if (RESIZING) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (MOVING_MET)
                                                                                                                                                                                                                                                   enum.hasMoreElements ();)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ((Vertex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      yPosition - prevPoint.y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            diagonalPoint);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    prevPoint.y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  prevPoint.y);
                                                                                                                                                                                                                                                                                                                                                                                                                                     prevPoint.y);
                                                                                                                                                                                                                                                                                                                         Ë
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DataFlowComponent dfc = selectedComponent.getDataFlowComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ((bounds.getMaxX () >= WIDTH) && (xPosition >= prevPoint.x))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   bounds = (Rectangle) selectedComponent.getShape ().getBounds
                                                                                                                                        event that occurs when a mouse button is released on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Handles the event that occurs when the mouse is dragged on this
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (((bounds.getMinX () <= 0) && (xPosition <= prevPoint.x))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              () <= 0) && (yPosition <= prevPoint.y))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ((bounds.getMaxY () >= HEIGHT) && (yPosition >=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   System.out.println ("thisi isi it" + bounds);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else if (flags == MouseEvent.BUTTON1_MASK) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (selectedComponent != null || MOVING_ALL)
                                                                                                                                                                                                                                                                                                                                                                                               //System.out.println ("MouseReleased");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //System.out.println ("MouseDragged");
                                                                                                                                                                                                                                                                                                                         public void mouseReleased (MouseEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       @param e The MouseEvent that occurs.
                                                                                                                                                                                                                                                   * Oparam e The MouseEvent that occurs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public void mouseDragged (MouseEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        int flags = e.getModifiers ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                setCursor (DEFAULT_CURSOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  int xPosition = e.getX ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        int yPosition = e.getY ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   //setCursor (DEFAULT_CURSOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                     MOVING_COMPONENT = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (bounds.getMinY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             diagonalPoint = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MOVING_LABEL = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (!MOVING_ALL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MOVING_MET = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MOVING_ALL = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                pending ????
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RESIZING = false;
                                                                                                                                              * Handles the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                prevPoint.y)))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                //
if
                                                                                                                                                                              this panel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      **/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 panel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ë
```

```
* Handles the event that occurs when the mouse is moved on this panel
                                                                                                                                                                                                                                                                                                                         for (Enumeration e = handlesVector.elements (); e.hasMoreElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ||
|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    p.setLocation (r2D.getMinX () + w, r2D.getMinY () + w); else if (rect.getMaxX () >= r2D.getMaxX () && rect.getMinY ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \Box
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (rect.getMaxX () >= r2D.getMaxX () && rect.getMaxY () >=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else if (rect.getMinX () <= r2D.getMinX () && rect.getMinY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (rect.getMinX () <= r2D.getMinX () && rect.getMaxY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rectangle2D r2D = (Rectangle2D) selectedComponent.getShape
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            p.setLocation (r2D.getMinX () + w, r2D.getMaxY () - w);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      p.setLocation (r2D.getMaxX () - w, r2D.getMaxY () - w);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           p.setLocation (r2D.getMaxX () - w, r2D.getMinY () + w);
prevPoint.setLocation (xPosition, yPosition);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                diagonalPoint = getDiagonalPoint (r2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      System.out.println ("Inside getDiagonalPoint");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public Point2D getDiagonalPoint (Rectangle2D rect)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              //System.out.println ("Inside mouse moved");
                                                                                                                                                                                                                                                                                                                                                                                              r2D = (Rectangle2D) e.nextElement ();
                                                                                                                                                                         public boolean isHoldingHandle (int x, int y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * @param e The MouseEvent that occurs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Point2D p = new Point2D.Double ();
int w = (int) rect.getWidth () / 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void mouseMoved (MouseEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                          if (r2D.contains (x, y))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           int xPosition = e.getX ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                System.out.println (p);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        flag = true;
                                                                                                                                                                                                                                                 boolean flag = false;
                                                                                                                                                                                                                                                                                      Rectangle2D r2D;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return flag;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ().getBounds ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     r2D.getMaxY ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         r2D.getMinY ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           r2D.getMaxY ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return p;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    r2D.getMinY ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else if (selectedComponent.containsClickedPoint (xPosition,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ((Vertex) dfc).setLocation (xPosition - prevPoint.x,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 dfc.setMetOffset (xPosition - prevPoint.x, yPosition
                                                                                                    ((Vertex) dfc).setLocation (xPosition - prevPoint.x,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            handlesVector = selectedComponent.getStringHandles
                                                                                                                                                                                                                                                                                                                                                                                           if (selectedComponent.getLabelShapeBounds ().contains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      handlesVector = selectedComponent.getStringHandles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (selectedComponent.getMetShapeBounds ().contains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            handlesVector = selectedComponent.getHandles ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ((Edge) dfc).reShape (xPosition, yPosition);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              dfc.setLabelOffset (xPosition - prevPoint.x,
                                                                                                                                                                                                                                                                                   Ë
                                                                                                                                                                                                         ((Edge) dfc).reShape (xPosition, yPosition);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ((External) dfc).setLocation (xPosition
                                                                                                                                                                                                                                                                                   handlesVector = selectedComponent.getHandles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        parentFrame.setSaveRequired (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              parentFrame.setSaveRequired (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               parentFrame.setSaveRequired (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          selectedComponent.update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (dfc instanceof External) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    //selectedComponent.update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         clearAllComponentsFromScreen (null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (dfc instanceof Vertex)
                                                                                                                                                                                                                                                 selectedComponent.update ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (selectedComponent.getLabelShapeBounds ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (selectedComponent.getLabelShapeBounds ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MOVING_COMPONENT = true;
                                                                  if (dfc instanceof Vertex)
                               else if (MOVING_COMPONENT) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 //setCursor (MOVE_CURSOR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOVING_LABEL = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    prevPoint.x, yPosition - prevPoint.y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MOVING_MET = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              setCursor (MOVE_CURSOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              paint (getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                             (xPosition, yPosition)) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  yPosition - prevPoint.y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (xPosition, yPosition)) {
                                                                                                                                       prevPoint.y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 yPosition - prevPoint.y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else
                                                                                                                                                                                                                                                                                                                                                        else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       prevPoint.y);
                                                                                                                                       yPosition -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      yPosition))
```

```
// This takes care
                                                                                                                                                                                                                                                                                                                    for (int ix = 0; ix < ColorConstants.COLOR_NAMES.length; ix++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ((Vertex) selectedComponent.getDataFlowComponent ()).setColor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           clearAllComponentsFromScreen ((Graphics2D) getGraphics ());
                                                                                                                             "Open", JOptionPane.INFORMATION_MESSAGE, null,
                                                                                                                                                                                                                                                                                                                                                                                          if (ColorConstants.COLOR_NAMES [ix].equals (selected))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      displayComponentVector.removeElement (selectedComponent);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    == popupMenu.getDeleteMenuItem ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         else if (e.getSource () == popupMenu.getPropMenuItem ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (!(selectedComponent.getDataFlowComponent () instanceof
                             else if (e.getSource () == popupMenu.getColorMenuItem ())
String selected = (String) JOptionPane.showInputDialog
                                                                                                                                                                                                              ColorConstants.COLOR_NAMES [0]);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         parentFrame.getTreePanel ().removeDfc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               setParentVertex (parentVertex, null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            showProperties (selectedComponent);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (selectedComponent.getDataFlowComponent ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     parentFrame.setSaveRequired (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public void setSelectAllMode (boolean b)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void deleteSelectedComponent ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      selectedComponent.delete ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            :
:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 paint (getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public Vertex getParentVertex ()
                                                                                                                                                                                                                                                                                                                                                                                                                               colorIndex = ix;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         deleteSelectedComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          <u>:</u>
                                                                                                                                                                                                                                              (selected != null) (
                                                                                                     "Select color : ",
                                                                                                                                                                                                                                                                                    int colorIndex = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (e.getSource ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  selectAllComponents
                                                                                                                                                                           ColorConstants.COLOR_NAMES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      return parentVertex;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (selectAllMode)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  selectAllMode = b;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  of unremoved streams
                                                                                                        (parentFrame,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (colorIndex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   External))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         selectedComponent.setLabelShape ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                 yPosition)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Font Selection", JOptionPane.INFORMATION_MESSAGE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     for (int ix = 0; ix < FontConstants.FONT_NAMES.length; ix++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  selectedComponent.setMetShape ((Graphics2D) getGraphics ());
clearAllComponentsFromScreen ((Graphics2D) getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                            if (dc.equals (selectedComponent) && (MOVING_COMPONENT ||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      selectedComponent.getDataFlowComponent ().setLabelFontIndex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   selectedComponent.getDataFlowComponent ().setMetFontIndex
                                                                                                                                     for (Enumeration enum = displayComponentVector.elements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (FontConstants.FONT_NAMES [ix].equals (selected))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        popupMenu.getDecomposeMenuItem ()) {
                                                                                                                                                                                                                                                                                 dc.getLabelShapeBounds ().contains (xPosition,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              String selected = (String) JOptionPane.showInputDialog
                                                                                                                                                                                                                                                 (dc.containsClickedPoint (xPosition, yPosition)
                                                                                                                                                                                                                                                                                                                                                          (dc.getMetShapeBounds ().contains (xPosition
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (e.getSource () == popupMenu.getFontMenuItem ())
                                                                                                                                                                                                              dc = (DisplayComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FontConstants.FONT_NAMES [0]);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         rubberBandLine (prevPoint.x, prevPoint.y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            rubberBandLine (xPosition, yPosition);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public void actionPerformed (ActionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  setCursor (MOVE_CURSOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           setCursor (HAND_CURSOR);
                                                                  setCursor (DEFAULT_CURSOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          paint (getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      //if (IS_COLLECTING_POINTS) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fontIndex = ix;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (selected != null) {
int yPosition = e.getY ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         null, FontConstants.FONT_NAMES,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           int fontIndex = 0;
                                                                                                        DisplayComponent dc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (parentFrame, "Select Font :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ||
|1
                                                                                                                                                                                                                                                                                                                                                                                                                                                               | MOVING_MET))
                                                                                                                                                                              enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (e.getSource ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   decompose ();
                                  if (selectMode)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (fontIndex + 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     + 1);
                                                                                                                                                                                                                                                                                                                                                                                            yPosition))) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MOVING_LABEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (fontIndex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뚜
```

```
} // End of the class DrawPanel.
                                                                                                                                                                                                                                                                                                                                                                                                handlesVector.addAll (dc.getHandles ());
handlesVector.addAll (dc.getStringHandles (dc.getLabelShapeBounds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         bounds = (Rectangle) bounds.createUnion (dc.getShape ().getBounds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     handlesVector.addAll (dc.getStringHandles (dc.getMetShapeBounds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Point last = (Point) ((Edge) currentEdge.getDataFlowComponent
                                                                                                                                                                                                                                                                                                for (Enumeration enum = displayComponentVector.elements ();
                                                                                                                                                                                                                                  displayComponentVector.elementAt (0)).getShape ().getBounds ();
                                                                                                                                                                                                                                                                                                                                                                       dc = (DisplayComponent) enum.nextElement ();
                                                                                                                                                                                                    bounds = (Rectangle) ((DisplayComponent)
                                                                                                                                                              if (!displayComponentVector.isEmpty ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public void setCurrentColor (int colorIndex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protected void rubberBandLine (int x, int y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public void setSelectionDefault (boolean b)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Graphics g = getGraphics ();
g.setColor (new Color (128, 128));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public void setCurrentFont (int fontIndex)
                                                                                                                                handlesVector.removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g.drawLine (last.x, last.x, x, y);
                        public void selectAllComponents ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g.setXORMode (Color.white);
                                                                                                  DisplayComponent dc = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ()).getPoints ().lastElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     currentColor = colorIndex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g.setColor (Color.black);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      currentFont = fontIndex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              selectedComponent = dc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              paint (getGraphics ());
                                                                                                                                                                                                                                                                                                                                         enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               selectionDefault = b;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g.setPaintMode ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ((()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ;
()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   230
```

```
namePanel.setBorder (BorderFactory.createTitledBorder (""));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (new JLabel ("Is it a state stream ?"), gbc);
                                                                                                                                                                                                                                                                                                                                                                                                  initValueButton = new JButton ("State Initial Value");
JPanel namePanel = new JPanel (new GridBagLayout ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        namePanel.add (new JLabel ("Stream Name :"), gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        namePanel.add (new JLabel ("Stream Type :"), gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gbc.gridwidth = 2; gbc. gridx = 0; gbc.gridy = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gbc.gridwidth = 2; gbc. gridx = 0; gbc.gridy = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gbc.gridwidth = 2; gbc. gridx = 0; gbc.gridy = 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gbc.gridwidth = 2; gbc. gridx = 0; gbc.gridy = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gbc.gridwidth = 2; gbc.gridx = 0; gbc.gridy = 4;
namePanel.add (new JLabel ("Latency :"), gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JPanel okPanel = new JPanel (new FlowLayout ());
                                                                                                                                                                                                                        yesButton = new JRadioButton ("Yes", false);
                                                                                                                                                                                                                                                                                                                                                                                                                                           initValueButton.addActionListener (this);
                                                                                                                                                  noButton = new JRadioButton ("No", true);
                                                                                                                                                                                                                                                                                                  ButtonGroup group = new ButtonGroup ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           namePanel.add (latencyUnitsCombo, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cancelButton = new JButton ("Cancel");
                                                                                                               streamTypeField = new JTextField (15);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cancelButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 namePanel.add (streamTypeField, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              initValueField = new JTextField (15);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     latencyUnitsCombo = getUnitsCombo ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       namePanel.add (initValueButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              namePanel.add (initValueField, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       helpButton.addActionListener (this);
                                                                                                                                                                                                                                                           yesButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  initValueField.setEditable (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  latencyField = new JTextField (10);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              helpButton = new JButton ("Help");
                                                                                                                                                                                  noButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gbc.gridwidth = 3; gbc. gridx = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gbc.gridwidth = 1; gbc. gridx = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    namePanel.add (latencyField, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          okButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gbc.gridwidth = 3; gbc. gridx = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gbc.gridwidth = 1; gbc.gridx = 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        gbc.gridwidth = 3; gbc.gridx = 2;
                                                                            nameField = new JTextField (15);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (nameField, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           namePanel.add (yesButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        namePanel.add (noButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    okButton = new JButton ("OK");
                                                                                                                                                                                                                                                                                                                                                            group.add (yesButton);
                                                                                                                                                                                                                                                                                                                                     group.add (noButton);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gbc. gridx = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gbc.gridx = 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  namePanel.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       namePanel.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Dimension screenSize = Toolkit.getDefaultToolkit().getScreenSize();
                                                                                                                                                                                                                                                                                                                               public class EdgeProperties extends JDialog implements ActionListener (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        setLocation ((screenSize.width - getWidth ()) / 2,
    (screenSize.height - getHeight ()) / 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GridBagConstraints gbc = new GridBagConstraints ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           super (parent, "StreamProperties", true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Box box = Box.createVerticalBox ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public EdgeProperties (Editor parent)
                                                                                                                                                                                                                                                              import caps.Parser.GrammarCheck;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JComboBox latencyUnitsCombo;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        JTextField streamTypeField;
                                                                                                                                                                                                                           import caps.Display.EdgePath;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JTextField initValueField;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public void initialize ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              parentFrame = parent;
setResizable (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JTextField latencyField;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JButton initValueButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JRadioButton yesButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JRadioButton noButton;
  package caps.GraphEditor;
                                                                                                                                                  import java.awt.event.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JTextField nameField;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JButton cancelButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JButton helpButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Editor parentFrame;
                                                                               import javax.swing.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       initialize ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JButton okButton;
                                                                                                                                                                                  import caps.Psdl.*;
                                                                                                                                                                                                                                                                                                                                                                                                           Edge targetEdge;
                                                                                                                  import java.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EdgePath ePath;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             pack ();
```

gbc.gridwidth = 1; gbc.gridx = 1; gbc.gridy = 0;

gbc.gridwidth = 1; gbc.gridx = 4;

okPanel.add (okButton, gbc);

gbc.insets = new Insets (5, 3, 5, 3);

gbc.fill = GridBagConstraints.BOTH;

```
if (!GrammarCheck.isValid (str, GrammarCheck.INTEGER_LITERAL))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    // To be able to delete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                parentFrame.getDataTypes ().addType (streamTypeField.getText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    latencyUnitsCombo.getSelectedIndex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      targetEdge.setInitialValue (initValueField.getText ());
                                                                                                                                                                 TextEditor.openDialog ("Stream Initial Value", "View or Edit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         showErrorDialog ("Illegal value for latency field");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (!GrammarCheck.isValid (str, GrammarCheck.TYPE_NAME))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       targetEdge.setStreamType (streamTypeField.getText ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             targetEdge.setMet (new PSDLTime (Integer.parseInt
                                                                                                                                                                                                                                    `
                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (!GrammarCheck.isValid (str, GrammarCheck.ID))
                                                                                                                                                                                                                                                                                           initValueField.setText (TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             showErrorDialog ("Illegal stream type name");
                                                                                                                                                                                                                            initValueField.getText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  targetEdge.setLabel (nameField.getText ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (latencyField.getText ().length () != 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           showErrorDialog ("Illegal stream name");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              targetEdge.setStateStream (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               targetEdge.setInitialValue ("");
                                                              initValueButton.setEnabled (false);
                                                                                                                                 (e.getSource () == initValueButton)
                                                                                                                                                                                                                                                                                                                                                                                                                        String str = nameField.getText ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    str = streamTypeField.getText ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (noButton.isSelected ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 targetEdge.setMet (null);
  (e.getSource () == noButton) {
                                                                                                                                                                                                                                                                                                                                                         if (e.getSource () == okButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             str = latencyField.getText ();
                                                                                                                                                                                                                                                            GrammarCheck.INITIAL_EXPRESSION, false)
                                                                                                                                                                                                                                                                                                                                                                                        boolean errorStatus = false;
                                    initValueField.setText ("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (str.length () != 0) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           errorStatus = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        errorStatus = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    errorStatus = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (!errorStatus) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (latencyField.getText ()),
                                                                                                                                                                                                Stream Initial Value",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a latency value
     if
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               latencyField.setText (String.valueOf (latency.getTimeValue ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 latencyUnitsCombo.setSelectedIndex (latency.getTimeUnits ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // Set default to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          initValueField.setText (targetEdge.getInitialValue ());
                                                                                                                                                                                                                                                                                                                          getContentPane ().add (box, BorderLayout.CENTER);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  streamTypeField.setText (e.getStreamType ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   latencyUnitsCombo.setSelectedIndex (1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               initValueButton.setEnabled (false);
                                                                                                                                                                                           (Box.createVerticalStrut (5));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public void actionPerformed (ActionEvent
                                                                                                                            (Box.createVerticalStrut (2));
                                                                                                                                                                                                                                                         (Box.createVerticalStrut (3));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           initValueButton.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          initValueButton.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PSDLTime latency = e.getMet ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (e.isStateStream () == false) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nameField.setText (e.getLabel ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         boolean exceptionOccurred = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (e.getSource () == yesButton) {
                         gbc.gridwidth = 1; gbc.gridx = 7;
okPanel.add (helpButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public void setEdgePath (EdgePath e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         yesButton.setSelected (true);
okPanel.add (cancelButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              noButton.setSelected (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            initValueField.setText ("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    initValueButton.doClick ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            latencyField.setText ("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (e.getMet () != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                  public void setEdge (Edge
                                                                                                                                                              (namePanel);
                                                                                                                                                                                                                          (okPanel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           setVisible (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 targetEdge = e;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ePath = e;
                                                                                                                                                                                                                       box.add
                                                                                                                                                                                                                                                      box.add
                                                                                                                            box.add
                                                                                                                                                         box.add
                                                                                                                                                                                           box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else {
```

```
* The panel that includes the Drawing area and tree view
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * The panel that the drawing operations are performed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * The panel that includes the tree structure to view
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public class Editor extends JFrame implements Runnable
                                                                                                                                                                                                                                                                                                                                                                                         ' It constructs and drives the other features.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * Includes the treePanel and the drawPanel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * the main toolbar of the GraphEditor
                                                                                                                                                                                                                                                                                                                                                            * The main frame for the Graph Editor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protected JSplitPane innerSplit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protected TreePanel treePanel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protected DrawPanel drawPanel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protected StatusBar statusBar;
                                                                                                                                                                                                                                                                                                                                                                                                                                            * @author Ilker DURANLIOGLU
                                                                                                                                                  javax.swing.event.*;
                                                                                                                                                                                                          caps.Psdl.DataTypes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protected ToolBar tBar;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protected JPanel panel;
package caps.GraphEditor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protected Vertex root;
                                                                                         java.awt.event.*;
                                                                                                                                                                               caps. Psdl. Vertex;
                                                                                                                     javax.swing.*;
                                                                                                                                                                                                                                         import caps.Parser.*;
                                                         import java.awt.*;
                                                                                                                                                                                                                                                                      import java.io.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                eversion
                                                                                                                                                                                                            import
                                                                                         import
                                                                                                                     import
                                                                                                                                                  import
                                                                                                                                                                               import
                                                                                                                                                                                                                                                                                                                                                                                                                                            parentFrame.getDrawPanel ().paint (parentFrame.getDrawPanel
                                                                                                                                                                                                                                         ePath.setLabelShape ((Graphics2D) parentFrame.getDrawPanel
                                                                                                                 ((java.util.Vector) parent.getSpecRegmts ().elementAt
                                                                                                                                                                                                                                                                                                                                                                                         parentFrame.getDrawPanel ().clearAllComponentsFromScreen
                                                                                                                                                                                                                                                                                                ePath.setMetShape ((Graphics2D) parentFrame.getDrawPanel
                                                                                         Vertex parent = (Vertex) targetEdge.getParent ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JOptionPane.showMessageDialog (this, str, "Error Message", JOptionPane.ERROR_MESSAGE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          System.out.println ("Help not available now");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             parentFrame.getTreePanel ().repaint ();
  targetEdge.setStateStream (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          parentFrame.setSaveRequired (true);
                                                         if (targetEdge.isStateStream ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ().getGraphics ()); // Is there a better way\
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (e.getSource () == cancelButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public void showErrorDialog (String str)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (e.getSource () == helpButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            } // End of the class EdgeProperties
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public JComboBox getUnitsCombo ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            JComboBox c =new JComboBox ();
                                                                                                                                                                                                                                                                                                                                                                                                                    // Is there a better way\
                                                                                                                                                                                                                                                                                                                                                          setVisible (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ("microsec");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             setVisible (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              c.addItem ("hours");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          c.addItem ("min");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ("sec");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     , ( " sm"
                                                                                                                                                  (2)).addElement ("");
                                                                                                                                                                                                                                                                 ().getGraphics ());
                                                                                                                                                                                                                                                                                                                             ().getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     c.addItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         c.addItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   c.addItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return c;
                                                                                                                                                                                                                                                                                                                                                                                                                      (null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        233
```

* The initial width of the GraphEditor

```
// Set this to true if you want to
                                                                                                                                                                                                                                                                                                                                                                                                                                Dimension screenSize = Toolkit.getDefaultToolkit().getScreenSize();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 innerSplit = new JSplitPane (JSplitPane.HORIZONTAL_SPLIT, p1, p2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       innerSplit.setBorder (BorderFactory.createLoweredBevelBorder ());
   setDefaultCloseOperation (WindowConstants.DO_NOTHING_ON_CLOSE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  panel.setBorder (BorderFactory.createLoweredBevelBorder ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (screenSize.height - INITIAL_HEIGHT) / 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setLocation((screenSize.width - INITIAL_WIDTH) / 2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       innerSplit.setDividerLocation (getWidth () / 5);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JScrollPane p1 = new JScrollPane (treePanel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JScrollPane p2 = new JScrollPane (drawPanel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      panel.add (innerSplit, BorderLayout.CENTER);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BorderLayout bLayout = new BorderLayout ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               panel.add (statusBar, BorderLayout.SOUTH);
                                           addWindowListener (new ExitEditor (this));
                                                                                                                                                                                                                                                                                                                                                                                              setSize (INITIAL_WIDTH, INITIAL_HEIGHT);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               innerSplit.setOneTouchExpandable (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  drawPanel = new DrawPanel (this, root);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       drawPanel.setParentVertex (root, null);
                                                                                                                                                                                                                                                                                                                   setJMenuBar (new EditorMenuBar (this));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      root);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       panel.add (tBar, BorderLayout.NORTH);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             innerSplit.setContinuousLayout(true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             panel.setAlignmentX (LEFT_ALIGNMENT);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                panel.setAlignmentY (TOP_ALIGNMENT)
                                                                                                                      statusBar = new StatusBar (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  treePanel = new TreePanel (this,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     pl.setBackground (Color.white);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PsdlParser.disable_tracing ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             p2.setBackground (Color.white);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                getContentPane ().add (panel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        root.setAllowsChildren (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        panel = new JPanel (bLayout);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tBar = new ToolBar (this);
                                                                                                                                                                                                                                      * Construct the GUI here
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       bLayout.setVgap (3);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  trace the parser actions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            setVisible (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  //super ("PSDL EDitor"); // *** Must also show the title of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          // Set the look and feel to a platform independent view
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       setTitle ("PSDL Editor : " + prototypeFile.getName ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public Editor (File prototype, Vertex r, DataTypes t)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    System.err.println("Error loading L&F: " + e);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * The initialization of the GUI takes place here
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (UIManager.getCrossPlatformLookAndFeelClassName ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // this is another thread to paint main window
                                                                                                               * The initial height of the Graph Editor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * The constructor for the editor frame
                                                                                                                                                                                          private final int INITIAL_HEIGHT = 600;
private final int INITIAL_WIDTH = 800;
                                                                                                                                                                                                                                                                                                                                                                                                                                protected boolean saveRequired;
                                                                                                                                                                                                                                                                                                                                                  protected File prototypeFile;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  prototypeFile = prototype;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 UIManager.setLookAndFeel
                                                                                                                                                                                                                                                                 protected DataTypes types;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void initialize ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  } catch (Exception e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          saveRequired = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            //initialize ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public void run ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            initialize ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     types = t;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                root = r;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       prototype ***
```

```
int ix = JOptionPane.showConfirmDialog (this, new String ("Save
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                getJMenuBar ().getMenu (0).getItem (0).setEnabled (false); //
                                                                                                                                                                                                                                                                                                                                                                            getJMenuBar ().getMenu (0).getItem (0).setEnabled (true); //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FileWriter testFile = new FileWriter (prototypeFile);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    StringWriter writer = new StringWriter ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        statusBar.setText ("Save not required");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (ix == JOptionPane.YES_OPTION)
                                                                                                                                                                                                                                                                                                                                                        statusBar.setText ("Save required");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (ix == JOptionPane.CANCEL_OPTION)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CreatePsdl.build (root, types);
String str = CreatePsdl.getPsdl ();
                                                                                                                                                                                                                              public void setSaveRequired (boolean b)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           setCursor (Cursor.WAIT_CURSOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CreatePsdl.ReInit (writer);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public boolean isSaveRequired ()
                                                                                   public File getPrototypeFile ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public void savePrototype ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          testFile.write (str);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     savePrototype ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public boolean checkSaved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               to the prototype?"))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           boolean value = true;
                                                                                                                                             return prototypeFile
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           value = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return saveRequired,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (saveRequired) {
                                                                                                                                                                                                                                                                                             saveRequired = b;
if (saveRequired)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  disable save menu item
                                                                                                                                                                                                                                                                                                                                                                                                                  enable save menu item
return types;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return value;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   try (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  changes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Greturn the drawPanel object in this JFrame
                                                                                                                                                                          * Greturn the treePanel object in this JFrame
                                                                                   *** Pending -- is it needed? ***
Returns the TreePanel object in this frame
                                                                                                                                                                                                                                                                                                                                                                                                                                        * Returns the DrawPanel object in this frame
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Greturn the toolBar object in this JFrame
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        toolBar object in this frame
                                                                                                                                                                                                                                                                                                                                                                                                                  *** Pending -- is it needed? ***
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            *** Pending -- is it needed? ***
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public JSplitPane getSplitPane ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public DataTypes getDataTypes ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public StatusBar getStatusBar ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public DrawPanel getDrawPanel ()
                                                                                                                                                                                                                                        public TreePanel getTreePanel ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public ToolBar getToolBar ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public Vertex getRoot ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return innerSplit;
                                                                                                                                                                                                                                                                                                    return treePanel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return statusBar;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return drawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Returns the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return root;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          return tBar;
```

package caps.GraphEditor;

```
import javax.swing.*;

/**

* The MenuBar of the Graph Editor.

* @author Ilker DURANLIOGLU

* @version

* //

public class EditorMenuBar extends JMenuBar {

/**

* The constructor for this class.

*/

public EditorMenuBar (Editor parent)

{
    super ();
    add (new GE_FileMenu (parent));
    add (new GE_EditMenu (parent));
    add (new GE_PSDLMenu (parent));
    add (new GE_PSDLMenu (parent));
    add (new GE_HelpMenu (parent));
    add (new GE_HelpMenu (parent));
    add (new GE_HelpMenu (parent));
}

// End of the class EditorMenuBar
```

```
public static String FONT_NAMES [] = { "Courier Bold 10", "Courier Bold 14", "Courier Bold 14",
                                                                                                            "Courier Plain 10", "Courier Plain 12", "Courier Plain 14" };
                                                                                                                                                                                                                                                                                                                                                                                                                               } // End of the class ColorConstants
                                                                                                                                                                                                                           "Courier", "Plain", "14" };
                                                     public class FontConstants {
package caps.GraphEditor;
                                                                                                                                                                                                 "Plain", "12",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          //System.exit (0); // *** Pending should normally close the window
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * @param e The window event that is created when the program close
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    caps.CAPSMain.CAPSMainWindow.removeEditor (editor);
editor.setVisible (false);
editor.dispose ();
                                                                                                                                                                   * Closes the caps main window and exits from the program.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Window event handler for the menu events.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public void windowClosing (WindowEvent e)
                                                                                                                                                                                                                                                                                                              class ExitEditor extends WindowAdapter {
                                                       import java.awt.event.WindowAdapter;
import java.awt.event.WindowEvent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (editor.checkSaved ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    } // End of the class ExitEditor
                                                                                                                                                                                                                                                                                                                                                                                                                               public ExitEditor (Editor e)
                                                                                                                                                                                                                             * @author Ilker DURANLIOGLU
package caps.GraphEditor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        editor = e;
                                                                                                                                                                                                                                                                                                                                                                          Editor editor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      icon is pressed.
                                                                                                                                                                                                                                                           * @version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          237
```

```
private JMenuItem selectAllMenuItem = new JMenuItem ("Select All");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public class GE_EditMenu extends JMenu implements ActionListener {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               private JMenuItem deleteMenuItem = new JMenuItem ("Delete");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               //private JMenuItem pasteMenuItem = new JMenuItem ("Paste");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            //private JMenuItem copyMenuItem = new JMenuItem ("Copy");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               private JMenuItem redoMenuItem = new JMenuItem ("Redo");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               private JMenuItem undoMenuItem = new JMenuItem ("Undo");
                                                                                                                                                                                                                                                                            * Also handles the events associated with the Edit Menu.
                                                                                                                                                                                                                                      * Constructs the Edit menu of the menubar,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * The constructor for the Edit menu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * Initiates the 'Delete' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * Initiates the 'Paste' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Initiates the 'Undo' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * Initiates the 'Copy' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Initiates the 'Redo' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (Editor
                                                                                                                                                                                                                                                                                                                                                            @author Ilker DURANLIOGLU
package caps.GraphEditor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        private Editor parent;
                                                                                                            import java.awt.event.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public GE_EditMenu
                                                                            import javax.swing.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        super ("Edit");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        parent = e;
                                                                                                                                                                                                                                                                                                                                                                                                      * @version
```

```
selectAllMenuItem.setActionCommand ("Selects all the components on
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               deleteMenuItem.setActionCommand ("Delete the selected component");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   //copyMenuItem.setActionCommand ("Copy selected component into
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Handles the menu events that occur when one of the menu items
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          //pasteMenuItem.setActionCommand ("Paste the component in the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                selectAllMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             //pasteMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              //copyMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     deleteMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         undoMenuItem.setActionCommand ("Undo last action");
redoMenuItem.setActionCommand ("Redo last action");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         undoMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                       Take these lines out when they are implemented
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          selectAllMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    //pasteMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     //copyMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            deleteMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public void actionPerformed (ActionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   undoMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        redoMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                * Oparam e The associated ActionEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (e.getSource () == undoMenuItem)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     //pasteMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     deleteMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                //copyMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                     These are not implemented yet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      redoMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                 undoMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 redoMenuItem.addMouseListener
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   clipboard into the drawing area");
                                                                                                                                                    add (selectAllMenuItem);
                                                                                                                  //add (pasteMenuItem);
                                                                             //add (copyMenuItem);
                                                                                                                                                                                         add (deleteMenuItem);
add (redoMenuItem);
                                        addSeparator ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             the drawing area");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         is selected
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           clipboard");
```

add (undoMenuItem);

```
private JMenuItem restoreMenuItem = new JMenuItem ("Restore From
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public class GE_FileMenu extends JMenu implements ActionListener (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                private JMenuItem printMenuItem = new JMenuItem ("Print");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              private JMenuItem saveMenuItem = new JMenuItem ("Save");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                private JMenuItem exitMenuItem = new JMenuItem ("Exit");
                                                                                                                                                                                                                                                                                                                                                             * Also handles the events associated with the File Menu.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * Initiates the 'Restore From Save' event
                                                                                                                                                                                                                                                                                                                    * Constructs the File menu of the menubar.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * The constructor for the File menu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Initiates the 'Print' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Initiates the 'Save' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Initiates the 'Exit' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public GE_FileMenu (Editor e)
                                                                                                                                                                                                                                                                                                                                                                                                                                          * @author Ilker DURANLIOGLU
      package caps.GraphEditor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             private Editor parent;
                                                                                                                   import java.awt.event.*;
import java.awt.Cursor;
                                                                                                                                                                                                      import caps.Psdl.Vertex;
                                                                                import javax.swing.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           super ("File");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * @version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Save");
                                                                                                                                                                                                                                                                                                                    else if (e.getSource () == pasteMenuItem) {
    System.out.println ("Paste has not yet been implemented");
                                                                                                                                                                                             else if (e.getSource () == copyMenuItem) {
   System.out.println ("Copy has not yet been implemented");
System.out.println ("Undo has not yet been implemented");
                                                                             else if (e.getSource () == redoMenuItem) {
    System.out.println ("Redo has not yet been implemented");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       else if (e.getSource () == deleteMenuItem) {
   parent.getDrawPanel ().deleteSelectedComponent ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          parent.getDrawPanel ().setSelectAllMode (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                       else if (e.getSource () == selectAllMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              } // End of the class GE_EditMenu
```

(restoreMenuItem); (printMenuItem); add (exitMenuItem);

add add

add (saveMenuItem);

parent = e;

:::::

```
} // End of the class GE_FileMenu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PrintJob.print (panel, (Vertex) panel.getParentVertex ().getRoot
                                                                                                                                                                                                                                                                                         saveMenuItem.setActionCommand ("Save the prototype into disk");
                                                                                                                                                                                                                                                                                                                                    restoreMenuItem.setActionCommand ("Restore saved prototype from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         System.out.println ("Restore has not yet been implemented");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ^{\star} Handles the menu events that occur when one of the menu items
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  caps.CAPSMain.CAPSMainWindow.removeEditor (parent);
                                                                                                                                                                                                                                                                                                                                                                                                                     printMenuItem.setActionCommand ("Print the prototype");
exitMenuItem.setActionCommand ("Quit the graph editor");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            restoreMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    printMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                saveMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         exitMenuItem.addMouseListener (e.getStatusBar ());
                                           Take these lines out when they are implemented
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (e.getSource () == restoreMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DrawPanel panel = parent.getDrawPanel ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (e.getSource () == printMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else if (e.getSource () == exitMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              restoreMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public void actionPerformed (ActionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             printMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             saveMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  exitMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Gparam e The associated ActionEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (e.getSource () == saveMenuItem)
                                                                                                                        restoreMenuItem.setEnabled (false);
These are not implemented yet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          parent.dispose ();
parent.setVisible (false);
                                                                                                                                                                                                               saveMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (parent.checkSaved ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    parent.savePrototype ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * is selected
                                                                                                                                                                                                                                                                                                                                                                                   disk");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     :
:
```

```
System.out.println ("Streams help has not yet been implemented");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                exceptionsMenuItem.setActionCommand ("Opens help about exceptions");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       operatorsMenuItem.setActionCommand ("Opens help about operators");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Handles the menu events that occur when one of the menu items
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         streamsMenuItem.setActionCommand ("Opens help about streams");
                                                                                                                                                                                                                                                                                                                                                                                                                 psdlGrammarMenuItem.setActionCommand ("Opens help about PSDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        timersMenuItem.setActionCommand ("Opens help about timers");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       System.out.println ("PSDL Grammar help has not yet been
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    psdlGrammarMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               exceptionsMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             System.out.println ("Exceptions help has not yet been
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      System.out.println ("Operators help has not yet been
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            operatorsMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       streamsMenuItem.addMouseListener (e.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                timersMenuItem.addMouseListener (e.getStatusBar ());
                                                                               Take these lines out when they are implemented
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else if (e.getSource () == exceptionsMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else if (e.getSource () == operatorsMenuItem)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    else if (e.getSource () == streamsMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       psdlGrammarMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        exceptionsMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           operatorsMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         == psdlGrammarMenuItem)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   streamsMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   timersMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public void actionPerformed (ActionEvent e)
                                                                                                                                                               psdlGrammarMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                exceptionsMenuItem.setEnabled (false);
                                                                                                                                                                                                   operatorsMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Gparam e The associated ActionEvent
                                                                                                                                                                                                                                              streamsMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                 timersMenuItem.setEnabled (false);
                                    These are not implemented yet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (e.getSource ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          is selected
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        implemented");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        implemented");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           implemented");
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Grammar");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          **/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        private JMenuItem psdlGrammarMenuItem = new JMenuItem ("PSDL Grammar");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       private JMenuItem exceptionsMenuItem = new JMenuItem ("Exceptions");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            private JMenuItem operatorsMenuItem = new JMenuItem ("Operators");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public class GE_HelpMenu extends JMenu implements ActionListener (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   private JMenuItem streamsMenuItem = new JMenuItem ("Streams");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              private JMenuItem timersMenuItem = new JMenuItem ("Timers");
                                                                                                                                                                                                                                                                                   * Also handles the events associated with the Help Menu.
                                                                                                                                                                                                                                                  * Constructs the Help menu of the menubar.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Initiates the 'PSDL Grammar' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * The constructor for the Help menu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Initiates the 'Exceptions' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * Initiates the 'Operators' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Initiates the 'Streams' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Initiates the 'Timers' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (psdlGrammarMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public GE_HelpMenu (Editor e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (exceptionsMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (operatorsMenuItem);
                                                                                                                                                                                                                                                                                                                                                                         * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (streamsMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (timersMenuItem);
package caps.GraphEditor;
                                                                                                                       import java.awt.event.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        super ("Help");
                                                                               import javax.swing.*;
                                                                                                                                                                                                                                                                                                                                                                                                                 * @version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               add
```

```
private JMenuItem gotoParentMenuItem = new JMenuItem ("Goto Parent");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           private JMenuItem decomposeMenuItem = new JMenuItem ("Decompose");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gotoParentMenuItem.setActionCommand ("Goto the parent vertex"); decomposeMenuItem.setActionCommand ("Decompose the selected
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                private JMenuItem gotoRootMenuItem = new JMenuItem ("Goto Root");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gotoRootMenuItem.setActionCommand ("Goto the root operator");
                                                                                                                                                                                                                                                                                                                                                                                                                                   public class GE_PSDLMenu extends JMenu implements ActionListener {
                                                                                                                                                                                                                * Constructs the PSDL menu of the menubar.
* Also handles the events associated with the PSDL Menu.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gotoParentMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               decomposeMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * The constructor for the PSDL menu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Initiates the 'Goto Parent' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Initiates the 'Goto Root' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Initiates the 'Decompose' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public GE_PSDLMenu (Editor e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       add (gotoParentMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    add (decomposeMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 add (gotoRootMenuItem);
                                                                                                                                                                                                                                                                                                                           * @author Ilker DURANLIOGLU
package caps.GraphEditor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      private Editor parent;
                                                                     import javax.swing.*;
import java.awt.event.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      super ("PSDL");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               parent = e;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     component");
                                                                                                                                                                                                                                                                                                                                                                   * @version
                                                               System.out.println ("Timers help has not yet been implemented");
```

else if (e.getSource () == timersMenuItem) {

} // End of the class GE_HelpMenu

```
private JCheckBoxMenuItem selectionModeMenuItem = new JCheckBoxMenuItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           private JCheckBoxMenuItem treeViewMenuItem = new JCheckBoxMenuItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      private JCheckBoxMenuItem toolTipsMenuItem = new JCheckBoxMenuItem
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public class GE_ViewMenu extends JMenu implements ActionListener {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 private JMenuItem refreshMenuItem = new JMenuItem ("Refresh");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          private JMenuItem colorMenuItem = new JMenuItem ("Color");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    private JMenuItem fontMenuItem = new JMenuItem ("Font");
                                                                                                                                                                                                                                                                                            * Also handles the events associated with the View Menu.
                                                                                                                                                                                                                                                         * Constructs the View menu of the menubar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * The constructor for the View menu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * Initiates the 'Tree View' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * Initiates the 'Refresh' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Initiates the 'Color' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             private ToolTipManager manager;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Initiates the 'Font' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        private Editor parentFrame;
                                                                                                                                                                                                                                                                                                                                                                                     * @author Ilker DURANLIOGLU
package caps.GraphEditor;
                                                                                                                       import java.awt.event.*;
                                                                                  import javax.swing.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ("Auto Select Mode");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ("Tool Tips");
                                                                                                                                                                                                                                                                                                                                                                                                                                 * @version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ("Tree");
                                                                                                                                                                                                                                                                                                                                                                                                                          * Handles the menu events that occur when one of the menu items
                                         gotoParentMenuItem.addMouseListener (parent.getStatusBar ());
                                                                              decomposeMenuItem.addMouseListener (parent.getStatusBar ());
gotoRootMenuItem.addMouseListener (parent.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else if (e.getSource () == gotoParentMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (e.getSource () == decomposeMenuItem)
                                                                                                                                                                                                             gotoParentMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                      decomposeMenuItem.addActionListener (this);
                                                                                                                                                                    gotoRootMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public void actionPerformed (ActionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           parent.getDrawPanel ().gotoParent ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (e.getSource () == gotoRootMenuItem)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      parent.getDrawPanel ().decompose ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      parent.getDrawPanel ().gotoRoot ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Oparam e The associated ActionEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   } // End of the class GE_PSDLMenu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          is selected
```

public GE_ViewMenu (Editor parent)

super ("View");

**/

```
for (int ix = 0; ix < FontConstants.FONT_NAMES.length; ix++) {</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for (int ix = 0; ix < ColorConstants.COLOR_NAMES.length; ix++)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Font Selection", JOptionPane.INFORMATION_MESSAGE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        parentFrame.getSplitPane ().getLastDividerLocation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 parentFrame.getDrawPanel ().setCurrentColor (colorIndex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (ColorConstants.COLOR_NAMES [ix].equals (selected)
                                                                                                                                                                the menu items
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (FontConstants.FONT_NAMES [ix].equals (selected))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               parentFrame.getDrawPanel ().setCurrentFont (fontIndex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JOptionPane.INFORMATION_MESSAGE, null, ColorConstants.COLOR_NAMES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        parentFrame.getSplitPane ().setDividerLocation (0.0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                String selected = (String) JOptionPane.showInputDialog
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   String selected = (String) JOptionPane.showInputDialog
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      parentFrame.getSplitPane ().setDividerLocation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ColorConstants.COLOR_NAMES [0])
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FontConstants.FONT_NAMES [0]);
                                                                                                                                                             menu events that occur when one of
      selectionModeMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else if (e.getSource () == treeViewMenuItem) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    else if (e.getSource () == toolTipsMenuItem)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else if (e.getSource () == fontMenuItem)
                                                                                                                                                                                                                                                                                                                                                    public void actionPerformed (ActionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (!treeViewMenuItem.isSelected ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (toolTipsMenuItem.isSelected ())
                                                                                                                                                                                                                                                                          * @param e The associated ActionEvent
                                                                                                                                                                                                                                                                                                                                                                                                                              if (e.getSource () == colorMenuItem)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Color Selection",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       colorIndex = ix;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       fontIndex = ix;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (selected != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (selected != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     int colorIndex = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (parentFrame, "Select Font : ",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  null, FontConstants.FONT_NAMES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        int fontIndex = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (parentFrame, "Select color:
                                                                                                                                                    * Handles the
                                                                                                                                                                                                   is selected
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ;
()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     colorMenuItem.setActionCommand ("Changes the current color of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              " on the drawing area");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 toolTipsMenuItem.setActionCommand ("Enables/Disables tooltips");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             treeViewMenuItem.setActionCommand ("Makes visible/hides the tree
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 selectionModeMenuItem.setActionCommand ("Defaults to select mode
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   treeViewMenuItem.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        toolTipsMenuItem.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          refreshMenuItem.addMouseListener (parentFrame.getStatusBar ()); selectionModeMenuItem.addMouseListener (parentFrame.getStatusBar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                fontMenuItem.setActionCommand ("Changes the current font of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         refreshMenuItem.setActionCommand ("Refreshes the display on the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     colorMenuItem.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 fontMenuItem.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Take these lines out when they are implemented
                                                                                                                                                                                                                              manager = ToolTipManager.sharedInstance ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            treeViewMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    toolTipsMenuItem.addActionListener (this);
                                                                                                                                                       selectionModeMenuItem.setSelected (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         refreshMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     colorMenuItem.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          fontMenuItem.addActionListener (this);
                                                                             treeViewMenuItem.setSelected (true);
                                                                                                               toolTipsMenuItem.setSelected (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      //colorMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              //fontMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         after each insertion of a component" +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   These are not implemented yet
                                                                                                                                                                                                                                                                                                            manager.setInitialDelay (400);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             add (selectionModeMenuItem);
                                                                                                                                                                                                                                                                    manager.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      add (treeViewMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (toolTipsMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       add (refreshMenuItem);
parentFrame = parent;
                                                                                                                                                                                                                                                                                                                                                                                   (colorMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                        (fontMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  addSeparator ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                             addSeparator ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               drawing area")
                                                                                                                                                                                                                                                                                                                                                                                add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           add
                                                                                                                                                                                                                                                                                                                                                                                                                        add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              editor");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     editor")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               view");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ;
()
```

```
public class IdListEditor implements ActionListener (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    dialog = new JDialog (parentFrame, true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protected static DefaultListModel model;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            = 300;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            static JButton cancelButton;
static JButton helpButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protected static JButton deleteButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                 private static final int WIDTH = 400;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protected static JButton editButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protected static JLabel promptLabel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protected static JButton addButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public IdListEditor (Editor parent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  dialog.setSize (WIDTH, HEIGHT);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 protected static JButton okButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protected static JList inputArea;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       private static final int HEIGHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                dialog.setResizable (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protected static Vector vector;
                                                                                                                                                                                                                                                                                                       private static JDialog dialog;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             dialog.setVisible (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protected Editor parentFrame;
                                                                                                                                                    import caps.Parser.GrammarCheck;
                                                                                                                                                                                                                                                                                                                                                                     private static JPanel south;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      parentFrame = parent;
package caps.GraphEditor;
                                                                                                                         import java.awt.event.*;
                                                           import javax.swing.*;
                                                                                                                                                                                  import java.util.*;
                                                                                         import java.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protected
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protected
                                                                                                                                                                                                                                                                                                                                                                parentFrame.getDrawPanel ().setSelectionDefault (false);
                                                                                                                                                                                                                                                                                                    parentFrame.getDrawPanel ().setSelectionDefault (true);
                                                                                                                                                                                                                                              else if (e.getSource () == selectionModeMenuItem) {
                                                                                                                                                  DrawPanel panel = parentFrame.getDrawPanel ();
panel.paint (panel.getGraphics ());
                                                                                                                  else if (e.getSource () == refreshMenuItem)
                                                                                                                                                                                                                                                                            if (selectionModeMenuItem.isSelected ())
                                                           manager.setEnabled (false);
manager.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               } // End of the class GE_ViewMenu
                                                                                                                                                                                                                                                                                                                                       else
```

dialog.getContentPane ().setLayout (new BorderLayout(5, 5));

protected void initialize ()

initialize ();

```
for (Enumeration enum = model.elements (); enum.hasMoreElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // If there is a selected elements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (GrammarCheck.isValid (editedId, GrammarCheck.ID))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (newId != null && newId.length () != 0) {
   if (GrammarCheck.isValid (newId, GrammarCheck.ID)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          showErrorDialog ("Illegal Id value enetered");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              showErrorDialog ("Please select an Id to delete");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (editedId != null && editedId.length () != 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       showErrorDialog ("Illegal id value entered");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   model.setElementAt (editedId, index);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              String editedId = showEditDialog ((String)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                vector.addElement (enum.nextElement ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                int index = inputArea.getSelectedIndex ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      int index = inputArea.getSelectedIndex ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         inputArea.setSelectedValue (newId,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else if (e.getSource () == deleteButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else if (e.getSource () == cancelButton)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (e.getSource () == editButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else if (e.getSource () == addButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     model.removeElementAt (index);
                                                                                                                                                                                                                                                                                         e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else if (editedId.length () == 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    parentFrame.setSaveRequired (true)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              String newId = showInputDialog ();
                                                                                                                                                                                                                                                                                   public void actionPerformed(ActionEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    model.removeElementAt (index);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  model.addElement (newId);
                                                                                                                                                                                                                                                                                                                                                              if (e.getSource () == okButton) {
                                                                                                                                                              return (Vector) vector.clone ();
                                   dialog.getContentPane ().add (south, BorderLayout.SOUTH);
south = new JPanel ();
```

```
JMenuItem decomposeMenuItem = new JMenuItem ("Decompose");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 JMenuItem propMenuItem = new JMenuItem ("Properties");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             JMenuItem deleteMenuItem = new JMenuItem ("Delete");
                                                                                                                                                                                                                                                                                                                                                                                                         JMenuItem colorMenuItem = new JMenuItem ("Color");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         decomposeMenuItem.addActionListener (parent);
                                                                                                                                                                                                                                                                                                                                  JWenuItem fontMenuItem = new JMenuItem ("Font");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   deleteMenuItem.addActionListener (parent);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   colorMenuItem.addActionListener (parent);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  fontMenuItem.addActionListener (parent);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             propMenuItem.addActionListener (parent);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public JMenuItem getDecomposeMenuItem ()
                                                                                                                                                                           public class Popup extends JPopupMenu (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public Popup (DrawPanel parent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         add (decomposeMenuItem);
                                                                                                          import javax.swing.JPopupMenu;
                                                                    import javax.swing.JMenuItem;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       add (deleteMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        add (colorMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    add (fontMenuItem);
package caps.GraphEditor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  add (propMenuItem);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                addSeparator ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     addSeparator ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            addSeparator ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           panel = parent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DrawPanel panel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          super ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return (String) JOptionPane.showInputDialog (dialog, "Edit Id", "ID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return JOptionPane.showInputDialog (dialog, "Enter new Id", "ID
                                                                                                                                                                                                                                                                                                                                                                   JOptionPane.showMessageDialog (dialog, str, "Error Message", JOptionPane.ERROR_MESSAGE);
                                                                 showErrorDialog ("Please select an Id to edit");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JOptionPane.QUESTION_MESSAGE, null, null, initial);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public String showEditDialog (String initial)
                                                                                                                                           else if (e.getSource () == helpButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Input Dialog", JOptionPane.QUESTION_MESSAGE);
                                                                                                                                                                                                                                                                                            public void showErrorDialog (String str)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public String showInputDialog ()
                          else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Edit Dialog",
```

247

public JMenuItem getColorMenuItem ()

public JMenuItem getFontMenuItem ()

return fontMenuItem;

return decomposeMenuItem;

```
public class PrintJob implements Runnable, Printable, Pageable (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public PrintJob (DrawPanel p, Vertex root)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             printablePages = new Vector (0, 2);
                                                                                                                                                                                   Import java.util.Enumeration;
                                                                                                                java.awt.BasicStroke;
                                                                                         java.awt.Graphics2D;
package caps.GraphEditor;
                                                                   java.awt.Graphics;
                                                                                                                                                                                                                                                                                                   Vector printablePages;
                                         import java.awt.print.*;
                                                                                                                                                                                                       import java.util.Vector;
                                                                                                                                  java.awt.geom.*;
                                                                                                                                                                                                                                                                                                                                                  PrinterJob printJob;
                                                                                                                                                                                                                                                                                                                                                                                              PageFormat format;
                                                                                                                                                           import caps.Psdl.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                         DrawPanel panel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    int orientation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                panel = p;
                                                                                                                                      import
                                                                   import
                                                                                           import
                                                                                                                import
                                                                                                                                                                                                                                                                                                                      public void showPopupMenu (boolean isEdge, int x, int y)
                                                                                                                                                                                                                                                                                                                                                                                         decomposeMenuItem.setEnabled (false);
colorMenuItem.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    decomposeMenuItem.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     colorMenuItem.setEnabled (true);
                                                                                  public JMenuItem getDeleteMenuItem ()
                                                                                                                                                                                                      public JMenuItem getPropMenuItem ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      // End of the class Popup
                                                                                                                                  return deleteMenuItem;
                  return colorMenuItem;
                                                                                                                                                                                                                                                    return propMenuItem;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              show (panel, x, y);
                                                                                                                                                                                                                                                                                                                                                                 if (isEdge) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        pack ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                              else (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        _
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     248
```

```
//if cancel is not selected
                                                                                   for (Enumeration enum = root.breadthFirstEnumeration ();
                                                                                                                                                 d = (DataFlowComponent) enum.nextElement ();
                                                                                                                                                                                                       printablePages.addElement ((Vertex) d);
                                                                                                                                                                              if (d instanceof Vertex && (d.isLeaf ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                           PageFormat f = printJob.defaultPage ();
                                                                                                                                                                                                                                                                                                                                                                                                printJob = PrinterJob.getPrinterJob();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      format = printJob.defaultPage ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    format = printJob.pageDialog (f);
orientation = PageFormat.PORTRAIT;
                                                                                                                                                                                                                                                                                                                                                                                                                           printJob.setPageable (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (!f.equals (format)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               printJob.print();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             } catch (Exception ex)
                                                                                                                      enum.hasMoreElements ();) {
                                                      DataFlowComponent d;
                                                                                                                                                                                                                                                                                                                                     public void run ()
```

```
// Disable margin settings
// They will have no effect
                                                                                                      if (format.getOrientation () == PageFormat.LANDSCAPE) {
   orientation = PageFormat.LANDSCAPE;
                                                                                                                                                                                                             format.setOrientation (PageFormat.PORTRAIT);
                                     public PageFormat getPageFormat (int pageIndex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public Printable getPrintable (int pageIndex)
                                                                                                                                                                        Paper p = new Paper ();
                                                                                                                                                                                                                                                                                                                                                            Paper p = new Paper ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 } // End of the class PrintJob
                                                                                                                                                                                                                                                                                                                                                                                      format.setPaper (p);
                                                                                                                                                                                                                                                  format.setPaper (p);
                                                                                                                                                                                                                                                                                                                                                                                                                                                             return format;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return this;
                                                                                                                                                                                                                                                                                                                       else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      panel.setParentVertex ((Vertex) printablePages.elementAt (pi), g2D);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // bounding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (orientation == PageFormat.PORTRAIT) {
    g2D.translate ((f.getWidth () - DrawPanel.WIDTH * scale) / 2,
    (f.getHeight () - DrawPanel.HEIGHT * scale) / 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             scale = f.getImageableWidth () / (double) (DrawPanel.HEIGHT + 35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g2D.translate (((DrawPanel.WIDTH * scale - f.getWidth ()) / 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      double scale = f.getImageableWidth () / (DrawPanel.WIDTH + 20);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    f.getImageableX () - (25 * scale)),
   (f.getImageableY () + (20 * scale)));
g2D.rotate (Math.toRadians (90));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g2D.setStroke (new BasicStroke (1.5f));
g2D.draw (new Rectangle2D.Double (-5, -5, 1029, 773));
                                                                                                                                         public static void print (DrawPanel p, Vertex root)
                                                                                                                                                                                                                                                                                                                                                   public int print (Graphics g, PageFormat f, int pi)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                printablePages.elementAt (pi)).getLabel (), 0, -30);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         g2D.drawString ("Parent Vertex : " + ((Vertex)
                                                                                                                                                                                                          PrintJob newJob = new PrintJob (p, root);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    g2D.setStroke (new BasicStroke (1f));
                                                                                                                                                                                                                                                                                                                                                                                                                           if (pi >= printablePages.size ()) {
    return Printable.NO_SUCH_PAGE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           // Draws components into graphics device
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Graphics2D g2D = (Graphics2D) g_t
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return printablePages.size ();
                                                                                                                                                                                                                                               new Thread (newJob).start ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   return Printable.PAGE_EXISTS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public int getNumberOfPages ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g2D.scale (scale, scale);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       rectangle around the prototype
ex.printStackTrace();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       f.getImageableWidth ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        + 10 + 10);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          249
```

```
Dimension screenSize = Toolkit.getDefaultToolkit().getScreenSize();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        dialog.setLocation ((screenSize.width - dialog.getWidth ()) / 2,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (screenSize.height - dialog.getHeight ()) / 2);
                                                                                                                                                                                                                           public class TextEditor implements ActionListener {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                dialog = new JDialog (parentFrame, true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protected static JButton okButton;
protected static JButton cancelButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protected static JTextArea inputArea;
                                                                                                                                                                                                                                                                                                                                                                                                                       private static final int WIDTH = 400;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protected static JLabel promptLabel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protected static JButton helpButton;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            dialog.setSize (WIDTH, HEIGHT);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      static boolean allowsEmptyString;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public TextEditor (Editor parent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     private static final int HEIGHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           dialog.setResizable (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   private static int grammarKind
                                                                                                                                                                                                                                                                                         private static JDialog dialog;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            dialog.setVisible (false);
                                                                                                                                                             import caps.Parser.GrammarCheck;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protected Editor parentFrame;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protected void initialize ()
                                                                                                                                                                                                                                                                                                                                                         private static JPanel south;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 parentFrame = parent;
       package caps.GraphEditor;
                                                                                                                              import java.awt.event.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       static String text;
                                                                import javax.swing.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        initialize ();
                                                                                                  import java.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          setText (((AbstractButton) e.getSource ()).getActionCommand ());
                                                                                                                                                   public class StatusBar extends JLabel implements MouseListener {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public void mouseReleased (MouseEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             е
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public void mouseEntered (MouseEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public void mouseExited (MouseEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public void mouseClicked (MouseEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void mousePressed (MouseEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public void mouseDragged (MouseEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  setText ("Save not required");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       setText ("Save required");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (parent.isSaveRequired ())
                                                                                                                                                                                                                                                                                                                                                  super ("Save not required");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                } // End of the class StatusBar
                                                                                                                                                                                                                                                                                    public StatusBar (Editor
package caps.GraphEditor;
                                                                                          import java.awt.event.*;
                                                           import javax.swing.*;
                                                                                                                                                                                                                      Editor parent;
                                                                                                                                                                                                                                                                                                                                                                                                                parent = e;
```

dialog.getContentPane ().setLayout (new BorderLayout(5, 5));

dialog.getContentPane ().add (south, BorderLayout.SOUTH);

south = new JPanel ();

```
JOptionPane.showMessageDialog (dialog, str, "Error Message",
                         showErrorDialog ("Illegal value entered");
                                                                                                                                                                                                                                                                                                                    parentFrame.setSaveRequired (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else if (e.getSource () == helpButton)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public void showErrorDialog (String str)
                                                                                                                                                                                                                                                                                     dialog.setVisible(false);
                                                                                                                                                                                                                                                                                                                                                                                                               else if (e.getSource () == ca
dialog.setVisible(false);
                                                           errorStatus = true;
                                                                                                                                                                                                                                                   if (!errorStatus) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JOptionPane.ERROR_MESSAGE);
                                                                                                                                                                                     text = "";
else {
                                                                                                                                                         else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public static void openDialog (String title, String prompt, String str,
                                                                                                                                                                                     inputArea.setBorder (BorderFactory.createLoweredBevelBorder ());
                                                      dialog.getContentPane ().add (promptLabel, BorderLayout.NORTH);
                                                                                                                                                                                                                                                                                dialog.getContentPane ().add (p, BorderLayout.CENTER);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (GrammarCheck.isValid (str, grammarKind))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | !allowsEmptyString)
                                                                                                                                                                                                                    JScrollPane p = new JScrollPane (inputArea);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public void actionPerformed(ActionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                cancelButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                 cancelButton = new JButton ("Cancel");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      String str = inputArea.getText (); if (str.length () != 0 || !allowsE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         text = inputArea.getText ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              helpButton = new JButton ("Help");
helpButton.addActionListener (this);
                                                                                                                                                                                                                                                   p.setBackground (Color.lightGray);
                                                                                                                                                                                                                                                                                                                                                                                  okButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (e.getSource () == okButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  boolean errorStatus = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public static String getString ()
                                                                                                                                                                                                                                                                                                                                                   okButton = new JButton ("OK");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    promptLabel.setText (prompt);
                                                                                                                                                   inputArea.setLineWrap (true);
                            promptLabel = new JLabel ();
                                                                                                                            inputArea = new JTextArea ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            inputArea.requestFocus ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (cancelButton);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        allowsEmptyString = flag;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         dialog.setVisible (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               dialog.setTitle (title);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             inputArea.setText (str);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          south.add (helpButton);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         south.add (okButton);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        text = text.trim ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        grammarKind = kind;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      int kind, boolean flag)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return text;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   text = str;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             south.add
```

```
* Initiates the 'Parent Specs' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   select.setToolTipText ("Select");
                                                                                                                                                                                                                                                                                                                                           * Initiates the 'Graph Desc' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  timers.setToolTipText ("Timers");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                operator.setFocusPainted (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Constructs a new ToolBar object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               types.setToolTipText ("Types");
                                                                                                                                                                                * Initiates the 'Timers' event
                                                                                                        ("caps/Images/parentSpec.gif"));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protected Editor parentFrame,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public ToolBar (Editor frame)
                                                                                                                                                                                                                                                                                                                                                                                                                            ("caps/Images/graphDesc.gif"));
                                                                                                                                                                                                                                                             ("caps/Images/timers.gif"));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                parentFrame = frame;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (parentSpecs);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (terminator);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 add (graphDesc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (operator);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (stream);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (select);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (timers);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (types);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public class ToolBar extends JToolBar implements ActionListener (
                                                                                                                                                                                                                                                                                                                                                                   * The main toolbar for the prototyping events.
* Also handles the events associated with the toolbar buttons.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   private JButton terminator = new JButton (new ImageIcon
("caps/Images/terminator.gif"));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          private JButton operator = new JButton (new ImageIcon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          private JButton stream = new JButton (new ImageIcon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       private JButton select = new JButton (new ImageIcon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                private JButton types = new JButton (new ImageIcon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Initiates the 'Terminator' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Initiates the 'Operator' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Initiates the 'Stream' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Initiates the 'Select' event
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Initiates the 'Types' event
                                                                                                                               javax.swing.border.Border;
                                                                                                                                                                                                            caps.Parser.GrammarCheck;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ("caps/Images/operator.gif"));
                                                                                                                                                                                                                                                                                                                                                                                                                                           * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ("caps/Images/streams.gif"));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ("caps/Images/select.gif"));
                                                                                                                                                                                                                                                                                        import java.io.StringReader;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ("caps/Images/types.gif"));
                                                                                                                                                         import caps.Psdl.DataTypes;
package caps.GraphEditor;
                                                                                                                                                                                                                                     import java.util.Vector;
                                                                                                    java.awt.event.*;
                                                                                                                                                                              caps. Psdl. Vertex;
                                                                                                                                                                                                                                                               import caps.Builder.*;
                                                import javax.swing.*;
                                                                            java.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * @version
                                                                                                                                                                                import
                                                                                                      import
                                                                            import
                                                                                                                                 Lmport
                                                                                                                                                                                                            Import
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   252
```

```
* @param frame The parent frame of this toolbar object.
private JButton parentSpecs = new JButton (new ImageIcon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            parentSpecs.setToolTipText ("Parent specifications");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               private JButton graphDesc = new JButton (new ImageIcon
                                                                                                                                                                                                                                                                                           private JButton timers = new JButton (new ImageIcon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 terminator.setToolTipText ("Draw a terminator");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             graphDesc.setToolTipText ("Graph Description");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * the JFrame that is the owner of this toolbar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               operator.setToolTipText ("Draw an operator");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            stream.setToolTipText ("Draw a stream");
```

```
PsdlBuilder.ReInit (new StringReader (TextEditor.getString ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TextEditor.openDialog ("Data Types", "View or Edit Data Types",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Vertex parent = parentFrame.getDrawPanel ().getParentVertex ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TextEditor.openDialog ("Parent Vertex Specification", "View or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PsdlBuilder.operator_spec ();
} catch (ParseException ex) { /* This is already caught in
                                                                                                       * Handles the action events that occur when one of the buttons
                                                                                                                                                                                                                                                                                                                                                                                                                          // *** Take out ***
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // *** Take out ***
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     parent.getSpecification (false)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      parentFrame.getDrawPanel ().setSelectMode (false);
parentFrame.getDrawPanel ().setCurrentComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      parentFrame.getDrawPanel ().setSelectMode (false);
parentFrame.getDrawPanel ().setCurrentComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    parentFrame.getDrawPanel ().setSelectMode (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               parentFrame.getDrawPanel ().setSelectMode (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             parentFrame.getDrawPanel ().setCurrentComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DataTypes types = parentFrame.getDataTypes ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          types.buildTypes (TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     types.toString (),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else if (e.getSource () == parentSpecs) {
                                                                                                                                                                                                                                                                                                                ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               else if (e.getSource () == terminator) {
                                                                                                                                                                                                                                                                                                             public void actionPerformed (ActionEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  System.out.println ("Terminator");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PsdlBuilder.setCurrentOp (parent);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (e.getSource () == select) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else if (e.getSource () == stream) {
                                                                                                                                                                                                                                    * @param e The associated ActionEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else if (e.getSource () == types) {
                                                                                                                                                                                                                                                                                                                                                                                                                       System.out.println ("Operator");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   operator.setFocusPainted (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    System.out.println ("Stream");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GrammarCheck.CHECK_PARENT_SPEC, false);
                                                                                                                                                                                                                                                                                                                                                                                              if (e.getSource () == operator) {
                                                                                                                                                         * in this toolbar is selected
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GrammarCheck.DATA_TYPE, true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Edit Parent Specification",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (DrawPanel.TERMINATOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (DrawPanel.OPERATOR);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (DrawPanel.STREAM);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GrammarCheck */ }
                                                                                                                                                                                                                                                                       types.setActionCommand ("Opens the text editor to edit data types");
                                                                                                                                                                                                                                                                                                                                                                                        timers.setActionCommand ("Opens the id list editor to edit timers"); graphDesc.setActionCommand ("Opens the text editor to edit the graph
                                                                                                                                                                                                                                                                                                                parentSpecs.setActionCommand ("Opens the text editor to edit parent
                                                                              terminator.setActionCommand ("Draws a terminator into the drawing
                                                                                                                                                      stream.setActionCommand ("Draws a stream into the drawing area");
operator.setActionCommand ("Draws an operator into the drawing
                                                                                                                                                                                         select.setActionCommand ("Selects a component from the drawing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * For example, When an operator is drawn on the DrawPanel, the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 parentSpecs.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * This method is called after another operation is finished
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          terminator.addMouseListener (parentFrame.getStatusBar ());
stream.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            graphDesc.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  operator.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       timers.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              types.addMouseListener (parentFrame.getStatusBar ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public void setOperatorButton (boolean flag)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                parentSpecs.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             terminator.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * with another button in the toolbar.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            graphDesc.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       operator.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     select.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         timers.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   stream.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           types.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               operator.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    operator.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public void enableSelectButton ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         select.addMouseListener
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  select.requestFocus ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         toolbar will go into
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * select mode.
                                                                                                                                                                                                                                                                                                                                                            specifications");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (flag)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   description");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           associated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else
                                                                                                                                                                                                                                                 area");
```

```
* The treepanel is the place where the hierarchic structure of * the prototype is displayed.
                                                                                                                                                                                                                                                                                                                                                                                                              * Gauthor Ilker DURANLIOGLU
                                                                                                                                           import javax.swing.event.*;
                                                                                                                                                                           import javax.swing.tree.*;
          package caps.GraphEditor;
                                                                                                    import javax.swing.*;
                                                                                                                                                                                                            import caps.Psdl.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TreeModelListener {
                                                                         import java.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gversion
                                                                                                                                                                                                                                                                           **/
                                   Vertex parent = parentFrame.getDrawPanel ().getParentVertex ();
                                                                                                                                                                                              Vertex parent = parentFrame.getDrawPanel ().getParentVertex ();
                                                                                                                                                                                                                                     TextEditor.openDialog ("Informal Graph Description", "View or
                                                                    IdListEditor.openDialog (parent.getTimerList ());
parent.setTimerList (IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                      parent.getGraphDesc (),
                                                                                                                                                                                                                                                                                                                                    GrammarCheck.INFORMAL_DESCRIPTION, true);
parent.setGraphDesc (TextEditor.getString ());
                                                                                                                                                                else if (e.getSource () == graphDesc) {
else if (e.getSource () == timers) {
                                                                                                                                                                                                                                                                     Edit Informal Graph Description",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               } // End of the class ToolBar.
```

```
DefaultTreeCellRenderer renderer = new DefaultTreeCellRenderer ();
public class TreePanel extends JTree implements TreeSelectionListener,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // Should show only the
                                                                                                                                                                                                                                                                                                                                                                                                                                      * @param frame The parent frame of this treepanel object.
                                                                                                                                  * the JFrame that is the owner of this panel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                setCellRenderer (new TreePanelRenderer ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public TreePanel (Editor frame, Vertex root)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (TreeSelectionModel.SINGLE_TREE_SELECTION);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          model = new DefaultTreeModel (root);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      getSelectionModel().setSelectionMode
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           model.setAsksAllowsChildren (true);
                                                                                                                                                                                                                                                                                                                                                                        * Constructs a new TreePanel object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 model.addTreeModelListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              addTreeSelectionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        setCellRenderer (renderer);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setShowsRootHandles(true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   setEditable (false);
                                                                                                                                                                                                                                                                    DefaultTreeModel model;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            parentFrame = frame;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               setModel (model);
                                                                                                                                                                                                     Editor parentFrame;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           super ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              composite ones
```

```
System.out.println ("Inside tree structure changed");
System.out.println ("Inside tree nodes inserted");
                                                                                                                                                                                                    System.out.println ("Inside tree nodes removed");
                                                                                                                                                                                                                                                                                                                           public void treeStructureChanged (TreeModelEvent
                                                                                                                          public void treeNodesRemoved (TreeModelEvent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               } // End of the class TreePanel
                                                                                                                                                                                                 public void addNewDFC (DataFlowComponent dfc, DataFlowComponent parent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else if (dfc instanceof Vertex & !(dfc instanceof External)) {
   if (((Vertex) dfc).isLeaf ()) { // If this is an atomic vertex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       parentFrame.getDrawPanel ().changeLevel ((Vertex) dfc.getParent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   parentFrame.getDrawPanel ().changeLevel ((Vertex) dfc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            parentFrame.getDrawPanel ().setSelectedDFC (dfc);
parentFrame.getDrawPanel ().decompose ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     parentFrame.getDrawPanel ().changeLevel ((Vertex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     parentFrame.getDrawPanel ().setSelectedDFC (dfc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   System.out.println ("Inside tree nodes changed");
                                                                                      setBorder (BorderFactory.createEtchedBorder ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     parentFrame.getDrawPanel ().setMenuBarItems ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public void treeNodesInserted (TreeModelEvent e)
                                                                                                                                                                                                                                                                                       System.out.println (parent.getChildCount ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public void valueChanged (TreeSelectionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                System.out.println ("Inside value changed");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public void treeNodesChanged (TreeModelEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              parentFrame.getDrawPanel ().gotoRoot ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TreePath path = e.getPath ();
DataFlowComponent dfc = (DataFlowComponent)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public void removeDfc (DataFlowComponent dfc)
                                                                                                                                                                                                                                                                                                                                                                     model.nodesWereInserted (parent, index);
                                                                                                                                                                                                                                                                                                                              int [] index = {parent.getIndex (dfc)};
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // If this is composite
      setAlignmentX (LEFT_ALIGNMENT);
setAlignmentY (TOP_ALIGNMENT);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          else if (dfc instanceof Edge) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    path.getLastPathComponent ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (dfc.isRoot ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      model.reload ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // If this is an Edge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               dfc.getParent ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;
()
```

```
/* Set the color and the font based on the SampleData userObject. */
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (userObject instanceof Vertex && ((Vertex) userObject).isLeaf ())
                                                                 /** Whether or not the item that was last configured is selected. */
                                                                                                                                                                                                * This is messaged from JTree whenever it needs to get the size
                                                                                                                                                                                                                                                                                                                                                                public Component getTreeCellRendererComponent(JTree tree, Object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              String stringValue = tree.convertValueToText(value, selected,
                                                                                                                                                                                                                                                                 * This attempts to set the font based on value, which will
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             expanded, leaf, row, hasFocus);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DataFlowComponent userObject = (DataFlowComponent) value;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else if (userObject instanceof Vertex && !((Vertex)
                                                                                                                                                                                                                                                                                                                                                                                                                                  boolean selected, boolean expanded,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else if (userObject instanceof Edge && ((Edge)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (((Vertex) userObject).isTerminator ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (((Vertex) userObject).isTerminator ())
                                                                                                                                                                                                                                     * of the component or it wants to draw it.
                                                                                                                                                                                                                                                                                                                                                                                                                                                               boolean leaf, int row,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    boolean hasFocus) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       setIcon (termCompositeIcon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    setIcon (opCompositeIcon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          setIcon (termAtomicIcon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        setText(stringValue);
/* Tooltips used by the tree.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    setIcon (opAtomicIcon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setIcon (stateStreamIcon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      setForeground(Color.cyan);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          setToolTipText(stringValue);
                                                                                                    protected boolean selected;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  setIcon (streamIcon);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              userObject).isStateStream ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         *
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      userObject).isLeaf()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /* Set the image.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /* Set the text.
                                                                                                                                                                                                                                                                                                    a TreeNode
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (hasFocus)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Font font;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              opCompositeIcon = new ImageIcon ("caps/Images/opComposite.gif");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public class TreePanelRenderer extends JLabel implements TreeCellRenderer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           termAtomicIcon = new ImageIcon ("caps/Images/termAtomic.gif");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                opAtomicIcon = new ImageIcon ("caps/Images/opAtomic.gif");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             streamIcon = new ImageIcon ("caps/Images/streamIcon.gif");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           System.out.println("Couldn't load images: " + e);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                /** Color to use for the background when selected. */
static protected final Color SelectedBackgroundColor =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             defaultFont = new Font("SansSerif", 0, 12);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          static protected ImageIcon termCompositeIcon;
                                                                                                                                                                                                                       javax.swing.tree.DefaultMutableTreeNode;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        static protected ImageIcon opCompositeIcon;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   static protected ImageIcon stateStreamIcon;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       static protected ImageIcon termAtomicIcon;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            termCompositeIcon = new ImageIcon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     static protected ImageIcon opAtomicIcon;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  stateStreamIcon = new ImageIcon
                                                                                                                                                                                                javax.swing.tree.TreeCellRenderer;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    static protected ImageIcon streamIcon;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Color.lightGray; //new Color(0, 0, 128);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           static protected Font defaultFont,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ("caps/Images/stateStreamIcon.gif");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ("caps/Images/termComposite.gif");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                } catch (Exception e) {}
                                                                                            javax.swing.ImageIcon;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 catch (Exception e)
                                                                                                                                javax.swing.JLabel;
                                                                                                                                                                                                                                                               java.awt.Component;
package caps.GraphEditor;
                                                                                                                                                                javax.swing.JTree;
                                                                                                                                                                                                                                                                                                                                                           java.awt.Graphics;
                                                                 javax.swing.Icon;
                                                                                                                                                                                                                                                                                                 java.awt.Color;
                                                                                                                                                                                                                                                                                                                                 java.awt.Font;
                                                                                                                                                                                                                                                                                                                                                                                             import caps.Psdl.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  try (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              static (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                try
                                                                 import
                                                                                                                                                                                                                                                                                                                                 import
                                                                                                                                import
                                                                                                                                                                import
                                                                                                                                                                                                import
                                                                                                                                                                                                                             import
                                                                                                                                                                                                                                                                                              mport
                                                                                                                                                                                                                                                                                                                                                              mport
                                                                                                                                                                                                                                                               import
                                                                                                 import
```

```
public class VertexProperties extends JDialog implements ActionListener
                                                                                                                                                                                                                                                                                                                                                                                                                              public static final int TO_TERMINATOR = 1;
                                                                                                                                                                                                                                                                                                                                                                         public static final int TO_OPERATOR = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public static final int UNCHANGED = 3;
                                                                                                                                                                      import caps. Display. DisplayVertex;
                                                                                                                                                                                                import caps. Parser. GrammarCheck;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          periodUnitsCombo
                                                                                                                                                                                                                                                         import java.util.Enumeration;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           private int changeStatus;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Juabel finishWithinLabel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              languageCombo;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JComboBox metUnitsCombo;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JComboBox operatorCombo;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JComboBox fwUnitsCombo;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JrextField periodField;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JComboBox triggerCombo;
package caps.GraphEditor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DisplayVertex dVertex;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   JComboBox timingCombo;
                                                         import javax.swing.*;
import java.awt.event.*;
                                                                                                                                                                                                                         import java.util.Vector;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JPanel keywordsPanel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TextArea ifCondField;
JTextField metField;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JrextField nameField;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Vertex targetVertex;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              triggerPanel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     timingPanel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  guardsPanel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JrextField fwField;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              JLabel periodLabel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                JPanel namePanel;
                                                                                                                                           import caps.Psdl.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Jlabel metLabel;
                                                                                                                  java.awt.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JPanel okPanel;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          JComboBox
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       JComboBox
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JPane1
                                                                                                                  import
                                                                                                                                                                                                                                                                                                                                                                                                                           * currently does not allow backgrounds other than white, and it
* will also fill behind the icon. Something that isn't desirable.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /* Pick background color up from parent (which will come from
                                                                                                                                                                                                                                                                                                                                                                                                  * paint is subclassed to draw the background correctly. JLabel
                                                                                                                                                                                                /* Update the selected flag for the next paint. */
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              offset = (currentI.getIconWidth()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g.fillRect(0, 0, getWidth()-1, getHeight()-1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if(currentI != null && getText() != null) {
  setForeground(userObject.getColor());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     bColor = getParent().getBackground();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            g.fillRect(offset, 0, getWidth() - 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       currentI = getIcon();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     bColor = SelectedBackgroundColor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         the JTree we're contained in). */
                                                                                                           setFont(userObject.getFont());
                           if(userObject.getFont() == null)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void paint (Graphics g) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            bColor = getBackground();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else if(getParent() != null)
                                                                                                                                                                                                                           this.selected = selected;
                                                      setFont(defaultFont);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       getHeight() - 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     g.setColor(bColor);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            super.paint(g);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       getIconTextGap());
                                                                                                                                                                                                                                                                                  return this;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if(selected)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Color
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else
```

JButton triggerReqByButton;

JButton ifConditionButton;

**/

*

. (`

. (:

```
keywordsPanel.setBorder (BorderFactory.createTitledBorder (""));
                                                                                                                                                                                                                                                                                                                                                                                                 informalDescButton = new JButton (" Informal Desc
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     getContentPane ().add (box, BorderLayout.CENTER);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gbc.gridwidth = 1; gbc.gridx = 1; gbc.gridy = 0;
okPanel.add (okButton, gbc);
                                                                                                                                                                                                                   gbc.insets = new Insets (1, 2, 1, 2);
keywordsPanel = new JPanel (new FlowLayout ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           formalDescButton = new JButton (" Formal Desc
                                                                                                                                                                                                                                                                                                                                keywordsButton = new JButton (" Keywords ");
quardsPanel.add (exceptionGuardsButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                 informalDescButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           okPanel = new JPanel (new GridBagLayout ());
                                                                   guardsPanel.add (exceptionListButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           formalDescButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                 keywordsButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    keywordsPanel.add (informalDescButton);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (Box.createVerticalStrut (3));
                                                                                                                                          guardsPanel.add (timerOpsButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  okButton.addActionListener (this);
cancelButton = new JButton ("Cancel");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cancelButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (Box.createVerticalStrut (5));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (Box.createVerticalStrut (5));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (Box.createVerticalStrut (2));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Box.createVerticalStrut (5));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (Box.createVerticalStrut (2));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        keywordsPanel.add (formalDescButton);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               helpButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    keywordsPanel.add (keywordsButton);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               helpButton = new JButton ("Help");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gbc.gridwidth = 1; gbc.gridx = 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                gbc.gridwidth = 1; gbc.gridx = 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             okPanel.add (cancelButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JComboBox c = new JComboBox ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  okButton = new JButton ("OK");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             okPanel.add (helpButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public JComboBox getUnitsCombo ()
                                gbc.gridx = 0; gbc.gridy = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (keywordsPanel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (triggerPanel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (timingPanel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (guardsPanel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (namePanel);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (okPanel);
                                                                                                            gbc.gridx = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           box.add
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 guardsPanel.setBorder (BorderFactory.createTitledBorder (""));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  <u>.</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        exceptionGuardsButton = new JButton (" Exception Guards
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    outputGuardsButton = new JButton (" Output Guards ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  exceptionListButton = new JButton (" Exception List
                                                                      :
(`
                                                                                                                                                                                                                                                                                                                                                              finishWithinLabel = new JLabel ("FinishWithin : ");
                                                                                                                                                                                                                                                                                                                                                                                                 gbc.gridwidth = 1; gbc.gridx = 1; gbc.gridy = 0;
timingPanel.add (timingCombo, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gbc.gridwidth = 2; gbc.gridx = 0; gbc.gridy = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           gbc.gridwidth = 1; gbc.gridx = 0; gbc.gridy = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gbc.gridwidth = 1; gbc.gridx = 0; gbc.gridy = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              guardsPanel = new JPanel (new GridBagLayout ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gbc.gridwidth = 1; gbc.gridx = 0; gbc.gridy = 3;
                                                                   Required By
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              exceptionGuardsButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     timerOpsButton = new JButton (" Timer Ops ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     exceptionListButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     outputGuardsButton.addActionListener (this);
                                                                                                                                                                                                                   fwReqByButton = new JButton (" Required By
                                                                                                         periodReqByButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               guardsPanel.add (outputGuardsButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         timingPanel.add (periodReqByButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                timingPanel.add (finishWithinLabel, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         timerOpsButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   timingPanel.add (periodUnitsCombo, gbc);
                                                                                                                                                                                                                                                    fwReqByButton.addActionListener (this);
                                                                                                                                                                                                                                                                                                                             ceriodLabel = new JLabel ("Period : ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gbc.insets = new Insets (1, 15, 1, 15);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            timingPanel.add (metReqByButton, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           timingPanel.add (metUnitsCombo, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    timingPanel.add (fwReqByButton, gbc);
                                   periodUnitsCombo = getUnitsCombo ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             timingPanel.add (fwUnitsCombo, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             timingPanel.add (periodLabel, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         timingPanel.add (periodField, gbc);
                                                                      periodReqByButton = new JButton ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gbc.gridwidth = 1; gbc.gridx = 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gbc.gridwidth = 1; gbc.gridx = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gbc.gridwidth = 1; gbc.gridx = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               gbc.gridwidth = 1; gbc.gridx = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      gbc.gridwidth = 1; gbc.gridx = 1;
                                                                                                                                                                                                                                                                                             metLabel = new JLabel ("MET : ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gbc.gridwidth = 1; gbc.gridx = 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gbc.gridwidth = 1; gbc.gridx = 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gbc.gridwidth = 1; gbc.gridx = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gbc.gridwidth = 1; gbc.gridx = 2;
                                                                                                                                                                                fwUnitsCombo = getUnitsCombo ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    timingPanel.add (metField, gbc);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           timingPanel.add (metLabel, gbc);
periodField = new JTextField ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    timingPanel.add (fwField, gbc);
                                                                                                                                             fwField = new JTextField ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gbc.gridx = 2;
```

:(

```
periodField.setText (String.valueOf (period.getTimeValue ()));
                                                                       periodUnitsCombo.setSelectedIndex (period.getTimeUnits ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       periodField.setText (String.valueOf (mcp.getTimeValue ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     periodUnitsCombo.setSelectedIndex (mcp.getTimeUnits ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      fwField.setText (String.valueOf (mrt.getTimeValue ()));
                                                                                                                                                                                                                                                                                                    fwField.setText (String.valueOf (fw.getTimeValue ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      fwUnitsCombo.setSelectedIndex (mrt.getTimeUnits ());
                                                                                                                                                                                                                                                                                                                                    fwUnitsCombo.setSelectedIndex (fw.getTimeUnits ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else if (tempVertex.getTimingType () == Vertex.SPORADIC)
                                                                                                                                                                                                         periodUnitsCombo.setSelectedIndex (1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    periodField.setText ("");
periodUnitsCombo.setSelectedIndex (1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public void setDisplayVertex (DisplayVertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     periodUnitsCombo.setSelectedIndex (1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        finishWithinLabel.setText ("MRT : ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           fwUnitsCombo.setSelectedIndex (1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fwUnitsCombo.setSelectedIndex (1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PSDLTime mcp = tempVertex.getMcp ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PSDLTime mrt = tempVertex.getMrt ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        fwUnitsCombo.setSelectedIndex (1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          metUnitsCombo.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          periodLabel.setText ("MCP : ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (tempVertex.isTerminator ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          metLabel.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       metField.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                      fwField.setText ("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      fwField.setText ("");
                                                                                                                                                                       periodField.setText
     if (period != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (mrt != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (mcp != null) {
                                                                                                                                                                                                                                                                 if (fw != null) {
                                                                                                                                          else {
                                                                                                                                                                                                                                                                                                                                                                                                              else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            timingCombo.setSelectedIndex (targetVertex.getTimingType ()); // and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             triggerCombo.setSelectedIndex (tempVertex.getTriggerType ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             languageCombo.setSelectedItem (tempVertex.getImpLanguage ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           metField.setText (String.valueOf (met.getTimeValue ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (triggerCombo.getSelectedIndex () == Vertex.UNPROTECTED)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           metUnitsCombo.setSelectedIndex (met.getTimeUnits ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (tempVertex.getTimingType () == Vertex.PERIODIC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 finishWithinLabel.setText ("Finish Within : ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                operatorCombo.setSelectedItem ("Terminator");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PSDLTime fw = tempVertex.getFinishWithin ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PSDLTime period = tempVertex.getPeriod ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   triggerStreamsButton.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                operatorCombo.setSelectedItem ("Operator");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                operatorCombo.removeActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ifCondField.setText (v.getIfCondition ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                triggerStreamsButton.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  timingCombo.removeActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                operatorCombo.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             metUnitsCombo.setSelectedIndex (1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    periodLabel.setText ("Period: ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               timingCombo.addActionListener (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSDLTime met = tempVertex.getMet ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nameField.setText (v.getLabel ());
                                                                                                                                                                                                                                                                                                                                                                                                                                   tempVertex = (Vertex) v.clone ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Otherwise it goes into actionperformed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               resetTimingPanelComponents ();
                                                                                                                                                                                                                                                                 public void setVertex (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            deletes the element of the vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               metField.setText ("");
                                                                                                                                                                                                                                                                                                                                 changeStatus = UNCHANGED,
("microsec");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (v.isTerminator ())
                                                                                                                               c.addItem ("hours");
                                                               ("sec");
                                                                                            c.addItem ("min");
                               :("sm")
                                                                                                                                                                                                                                                                                                                                                                                           targetVertex = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (met != null)
c.addItem
                               c.addItem
                                                               c.addItem
                                                                                                                                                                  return c;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else
```

```
IdListEditor.openDialog (tempVertex.getFinishWithinRegmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setButtonText (triggerStreamsButton, IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tempVertex.setFinishWithinReqmts (IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                            TextEditor.openDialog ("Operator Trigger If Condition", "View or
                                          (informalDescButton, tempVertex.getInformalDesc ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                setButtonText (triggerReqByButton, IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IdListEditor.openDialog (tempVertex.getTriggerStreamsList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tempVertex.setTriggerStreamsList (IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        setButtonText (periodReqByButton, IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else if (timingCombo.getSelectedIndex () == Vertex.SPORADIC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else if (timingCombo.getSelectedIndex () == Vertex.SPORADIC)
                                                                             setButtonText (formalDescButton, tempVertex.getFormalDesc ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IdListEditor.openDialog (tempVertex.getPeriodRegmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         setButtonText (metReqByButton, IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tempVertex.setPeriodReqmts (IdListEditor.getIDList ());
setButtonText (keywordsButton, tempVertex.getKeywordList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (timingCombo.getSelectedIndex () == Vertex.PERIODIC) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IdListEditor.openDialog (tempVertex.getTriggerReqmts ());
tempVertex.setTriggerReqmts (IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (timingCombo.getSelectedIndex () == Vertex.PERIODIC) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              setButtonText (fwReqByButton, IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IdListEditor.openDialog (tempVertex.getMcpReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IdListEditor.openDialog (tempVertex.getMrtRegmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tempVertex.setMcpReqmts (IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IdListEditor.openDialog (tempVertex.getMetReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              tempVertex.setMetReqmts (IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else if (e.getSource () == triggerStreamsButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tempVertex.setIfCondition (ifCondField.getText
                                                                                                                                                                                                                                                                                                                                                                                                                                 ifCondField.getText ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ifCondField.setText (TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else if (e.getSource () == triggerReqByButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (e.getSource () == periodReqByButton) {
                                                                                                                                                                                                                                                                                                        if (e.getSource () == ifConditionButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (e.getSource () == metReqByButton)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (e.getSource () == fwReqByButton)
                                                                                                                                                                                                                public void actionPerformed (ActionEvent e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tempVertex.setMrtReqmts
                                                                                                                                                                                                                                                                                                                                                                                             Edit Operator Trigger If Condition"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GrammarCheck.EXPRESSION, true);
                                          setButtonText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          setButtonText (exceptionListButton, tempVertex.getExceptionList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (fwReqByButton, tempVertex.getFinishWithinReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 setButtonText (triggerReqByButton, tempVertex.getTriggerReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              == Vertex.NON_TIME_CRITICAL) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (periodReqByButton, tempVertex.getPeriodReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (outputGuardsButton, tempVertex.getOutputGuardList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (periodReqByButton, tempVertex.getMcpReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 setButtonText (timerOpsButton, tempVertex.getTimerOpList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (metReqByButton, tempVertex.getMetReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (fwReqByButton, tempVertex.getMrtReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       periodReqByButton.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  finishWithinLabel.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  metReqByButton.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             periodUnitsCombo.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       metUnitsCombo.setEnabled (false);
                                                                                                                                                                         public void resetTimingPanelComponents ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (!tempVertex.isTerminator ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         setButtonText (exceptionGuardsButton,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (triggerStreamsButton,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      periodReqByButton.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 fwReqByButton.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (timingCombo.getSelectedIndex ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     periodUnitsCombo.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   fwUnitsCombo.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     periodLabel.setEnabled (false);
periodField.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      metLabel.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             metField.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  metReqByButton.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       fwReqByButton.setEnabled (true);
                                                                                                                                                                                                                                                                                                        if (!tempVertex.isTerminator ())
                                                                                                                                                                                                                                                                                                                                                                                                                                    metUnitsCombo.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tempVertex.getTriggerStreamsList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tempVertex.getExceptionGuardList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            fwUnitsCombo.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     periodLabel.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              periodField.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            fwField.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             finishWithinLabel.setEnabled
                                                                                                                                                                                                                                                              metLabel.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                             metField.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  fwField.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                   metField.setText ("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                periodField.setText ("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        fwField.setText ("");
                                      setVisible (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    setButtonText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           setButtonText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    setButtonText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              setButtonText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setButtonText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               setButtonText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          setButtonText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ;
()
```

```
if (!GrammarCheck.isValid (str,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (!GrammarCheck.isValid (str,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (!GrammarCheck.isValid (str,
                                                                                                                                                                                                                                                                                                                                   if (timingCombo.getSelectedIndex ()
                             else if (e.getSource () == okButton) {
                                                                                                           String str = nameField.getText ();
                                                                          boolean exceptionOccurred = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             exceptionOccurred = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            exceptionOccurred = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    exceptionOccurred = true
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    str = periodField.getText
                                                                                                                                                                                                                                                                                                                                                                                                          str = metField.getText ();
                                                                                                                                                                                                                          exceptionOccurred = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (str.length () i = 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (str.length () !=0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (!exceptionOccurred) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       languageCombo.getSelectedItem ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 str = fwField.getText
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GrammarCheck.INTEGER_LITERAL)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GrammarCheck.INTEGER_LITERAL)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GrammarCheck.INTEGER_LITERAL))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            field");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TextEditor.openDialog ("Formal Design Description", "View or Edit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "View or Edit Operator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   setButtonText (exceptionGuardsButton, TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TextEditor.openDialog ("Informal Design Description", "View or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     :
:
                                "View or Edit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       setButtonText (informalDescButton, TextEditor.getString ());
                                                                                                                                                                                                                    setButtonText (outputGuardsButton, TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                                                                                          tempVertex.getExceptionGuardList (),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            tempVertex.setExceptionGuardList (TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                TextEditor.openDialog ("Operator Exceptions", "View or Edit
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                setButtonText (formalDescButton, TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setButtonText (keywordsButton, IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tempVertex.setExceptionList (TextEditor.getString ());
setButtonText (exceptionListButton, TextEditor.getString
                                                                                                        tempVertex.getOutputGuardList (),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           setButtonText (timerOpsButton, TextEditor.getString ());
                                                                                                                                                                             tempVertex.setOutputGuardList (TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IdListEditor.openDialog (tempVertex.getKeywordList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TextEditor.openDialog ("Operator Exceptions", "View or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tempVertex.getExceptionList ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tempVertex.setKeywordList (IdListEditor.getIDList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tempVertex.getInformalDesc ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             tempVertex.setInformalDesc (TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tempVertex.getTimerOpList (),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tempVertex.setFormalDesc (TextEditor.getString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tempVertex.getFormalDesc
                             TextEditor.openDialog ("Operator Output Guard",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           tempVertex.setTimerOpList (TextEditor.getString
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              exceptionListButton) (
                                                                                                                                                                                                                                                                                            else if (e.getSource () == exceptionGuardsButton)
else if (e.getSource () == outputGuardsButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (e.getSource () == informalDescButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       else if (e.getSource () == timerOpsButton) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TextEditor.openDialog ("Operator Timers",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               formalDescButton)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (e.getSource () == keywordsButton)
                                                                                                                                                                                                                                                                                                                                                                                                                                           GrammarCheck.CHECK_EXCEPTION_GUARDS, true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GrammarCheck.CHECK_EXCEPTION_LIST, true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GrammarCheck.INFORMAL_DESCRIPTION, true);
                                                                                                                                         GrammarCheck.CHECK_OUTPUT_GUARDS, true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GrammarCheck.FORMAL_DESCRIPTION, true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GrammarCheck.CHECK_TIMER_OPS, true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ||
||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ħ
                                                                 Operator Output Guard Equation",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else if (e.getSource ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else if (e.getSource ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Edit Informal Description",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Operator Exceptions"
                                                                                                                                                                                                                                                                                                                                                                   Operator Exceptions"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Formal Description",
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Timers"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               262
```

```
!= Vertex.NON_TIME_CRITICAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Vertex.PERIODIC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Vertex.PERIODIC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    showErrorDialog ("Illegal value for period field");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (triggerCombo.getSelectedIndex () != Vertex.UNPROTECTED)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  showErrorDialog ("Illegal value for finish within
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  targetVertex.setTriggerType (triggerCombo.getSelectedIndex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    showErrorDialog ("Illegal value for mcp field");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       showErrorDialog ("Illegal value for mrt field");
                                                                                                                                                                                                                                                                                                                                                                                                                                                          showErrorDialog ("Illegal value for met field");
if (!GrammarCheck.isValid (str, GrammarCheck.ID))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 targetVertex.setLabel (nameField.getText ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (timingCombo.getSelectedIndex () ==
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ||
||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (timingCombo.getSelectedIndex ()
                                        showErrorDialog ("Illegal vertex name");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                targetVertex.setImpLanguage ((String)
                                                                                                                                                                                                                                                                                                                                 if (!(targetVertex.isTerminator ()))
```

```
<u>.</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            targetVertex.setIfCondition (tempVertex.getIfCondition ());
targetVertex.setOutputGuardList (tempVertex.getOutputGuardList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       targetVertex.setInformalDesc (tempVertex.getInformalDesc ());
                                                                                                                                                          targetVertex.setMcpReqmts (tempVertex.getMcpReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   targetVertex.setMrtReqmts (tempVertex.getMrtReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    fwUnitsCombo.getSelectedIndex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            dVertex.setLabelShape ((Graphics2D) parentFrame.getDrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              targetVertex.setKeywordList (tempVertex.getKeywordList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 targetVertex.setTimerOpList (tempVertex.getTimerOpList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           targetVertex.getFinishWithinReqmts ().removeAllElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     targetVertex.setTriggerReqmts (tempVertex.getTriggerReqmts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      targetVertex.setExceptionList (tempVertex.getExceptionList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        dVertex.setMetShape ((Graphics2D) parentFrame.getDrawPanel
targetVertex.setMcp (new PSDLTime (Integer.parseInt
                                                                                                                                                                                                                                                                                                                                                                                                                               targetVertex.setMrt (new PSDLTime (Integer.parseInt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             targetVertex.setFormalDesc (tempVertex.getFormalDesc ());
                                                                                                                                                                                                                                                                                                                 <u>:</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             targetVertex.getMrtReqmts ().removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        targetVertex.getPeriodRegmts ().removeAllElements ();
                                                                                                                                                                                                                                                                                                          targetVertex.getMcpReqmts ().removeAllElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       targetVertex.setTerminator (false);
parentFrame.getDrawPanel ().changeLevel ((Vertex)
                                                                                                                                                                                                                                                                                                                                                                                      if (fwField.getText ().length () != 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     else if (changeStatus == TO_TERMINATOR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             targetVertex.setExceptionGuardList
                                                                                                                                                                                                                                                                           targetVertex.setMcp (null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       targetVertex.setMrt (null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (changeStatus == TO_OPERATOR)
                                                                                                                 periodUnitsCombo.getSelectedIndex ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (tempVertex.getExceptionGuardList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         setVisible (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         targetVertex.getParent ());
                                        (periodField.getText ()),
                                                                                                                                                                                                                                     else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (fwField.getText ()),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ().getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ().getGraphics ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ((()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ;
()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ;
()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           · (C) ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      == Vertex.SPORADIC) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  targetVertex.setPeriodReqmts (tempVertex.getPeriodReqmts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                targetVertex.getFinishWithinReqmts ().removeAllElements
                                                                                                                                                                                            targetVertex.setTimingType (timingCombo.getSelectedIndex ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (periodField.getText ().length () != 0) {
    targetVertex.setPeriod (new PSDLFlime (Integer.parseInt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        targetVertex.getPeriodReqmts ().removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                            metUnitsCombo.getSelectedIndex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          targetVertex.setMetReqmts (tempVertex.getMetReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  == Vertex.PERIODIC) {
                                                                                                                                                                                                                                                                                                             !(targetVertex.isTerminator ())) {
                                                                                                                 targetVertex.setTriggerStreamsList (new Vector ());
                                                                                                                                                                                                                                                                                                                                                   targetVertex.setMet (new PSDLTime (Integer.parseInt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           targetVertex.getMetReqmts ().removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  targetVertex.getMcpReqmts ().removeAllElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       targetVertex.getMrtReqmts ().removeAllElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         targetVertex.setFinishWithin (new PSDLTime
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (periodField.getText ().length () != 0) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (fwField.getText ().length () != 0) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else if (!(targetVertex.isTerminator ())) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           targetVertex.setFinishWithin (null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         else if (timingCombo.getSelectedIndex ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    targetVertex.setFinishWithinReqmts
                                                                                                                                                                                                                                  if (timingCombo.getSelectedIndex () !=
   targetVertex.setTriggerStreamsList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         targetVertex.setPeriod (null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (timingCombo.getSelectedIndex ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               targetVertex.setMet (null);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            periodUnitsCombo.getSelectedIndex ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (Integer.parseInt (fwField.getText ()),
                                        (tempVertex.getTriggerStreamsList ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (tempVertex.getFinishWithinReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    fwUnitsCombo.getSelectedIndex ());
                                                                                                                                                                                                                                                                           Vertex.NON_TIME_CRITICAL &&
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (periodField.getText ()),
                                                                                                                                                                                                                                                                                                                                                                                         (metField.getText ()),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1.£
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ((()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ;
()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ë
```

```
if (targetVertex.isTerminator () && changeStatus == TO_TERMINATOR
                                                                           !targetVertex.isTerminator () && changeStatus == TO_OPERATOR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             o).length () != 0)))
                                                                                                                                                                                                                           if (triggerCombo.getSelectedIndex () == Vertex.UNPROTECTED)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (((o instanceof Vector) && (((Vector) o).size () != 0)) ||
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (timingCombo.getSelectedIndex () == Vertex.SPORADIC) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tempVertex.getFinishWithinReqmts ().removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    JOptionPane.showMessageDialog (this, str, "Error Message"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tempVertex.getPeriodReqmts ().removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              finishWithinLabel.setText ("Finish within : ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       tempVertex.getMrtReqmts ().removeAllElements ();
tempVertex.getMcpReqmts ().removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tempVertex.getMetReqmts ().removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     : ("..."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .
``
                                                                                                                                                                                                                                                               triggerStreamsButton.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                       triggerStreamsButton.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                   System.out.println ("Inside timingcombo");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public void setButtonText (JButton b, Object o)
                                                                                                                                                                                 else if (e.getSource () == triggerCombo) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ((o instanceof String) && (((String)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             <u>..</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  b.setText (b.getText ().trim () +
                                                                                                                                                                                                                                                                                                                                                                                                               else if (e.getSource () == timingCombo)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     metUnitsCombo.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (!b.getText ().endsWith ("..."))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              finishWithinLabel.setText ("MRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (b.getText ().endsWith ("..."))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void showErrorDialog (String str)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             periodLabel.setText ("Period
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             metLabel.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              metField.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (tempVertex.isTerminator ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       resetTimingPanelComponents ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             periodLabel.setText ("MCP :
                                                                                                                  changeStatus = UNCHANGED;
                                    // Restore ro older one
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     JOptionPane.ERROR_MESSAGE);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         else {
                                                                                                                                                                                                                                                                                                         else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                parentFrame.getDrawPanel ().paint (parentFrame.getDrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 parentFrame.getDrawPanel ().clearAllComponentsFromScreen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 metField.setText (String.valueOf (targetVertex.getMet
                                                                           targetVertex.breadthFirstEnumeration (); enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         metUnitsCombo.setSelectedIndex (targetVertex.getMet
                                                                                                               dfc = (DataFlowComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                           parentFrame.getDrawPanel ().changeLevel ((Vertex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                metUnitsCombo.setSelectedIndex (PSDLTime.ms);
                                                                                                                                                                                    ((Vertex) dfc).setTerminator (true);
((Vertex) dfc).setMet (new PSDLTime (0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             changeStatus = operatorCombo.getSelectedIndex ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        metUnitsCombo.setSelectedIndex (PSDLTime.ms);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     // It does not have met
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               parentFrame.getTreePanel ().repaint ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (targetVertex.getMet () != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   else if (e.getSource () == operatorCombo)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      parentFrame.setSaveRequired (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     == cancelButton)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ().getGraphics ()); // Is there a better way\
                                                                                                                                                if (dfc instanceof Vertex) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else if (e.getSource () == helpButton) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else if (changeStatus == TO_OPERATOR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (changeStatus == TO_TERMINATOR) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 metUnitsCombo.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         metUnitsCombo.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      metLabel.setEnabled (false);
metField.setEnabled (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              metField.setEnabled (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     metLabel.setEnabled (true);
                                       for (Enumeration enum =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            metField.setText ("");
   DataFlowComponent dfc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     metField.setText ("0");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (null); // Is there a better way\
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else if (e.getSource ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         setVisible (false);
                                                                                                                                                                                                                                                                                                                                                                                                                  targetVertex.getParent ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ().getTimeValue ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ().getTimeUnits ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             else {
                                                                                                                                                                                                                                                               PSDLTime.ms));
```

```
public abstract class DataFlowComponent extends DefaultMutableTreeNode {
                                                                                                                                                                                                                                                                                    * It extends DefaultMutableTreeNode, so every object of this class is
                                                                                                                                                                                                                        * DataFlowComponent is the abstract base class of the Vertex and * Edge classes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * The x-offset of the label from the center of the component
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * The y-offset of the label from the center of the component
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   // Op-_num or edge id
                                                         import javax.swing.tree.DefaultMutableTreeNode;
import java.awt.*;
import caps.GraphEditor.FontConstants;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * The label to display on the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * The font representation of the label.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * The font parameter of the label.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protected static int UNIQUE_ID = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * The unique id of components.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * The id of this component
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protected int labelYOffset;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 protected int labelXOffset;
                                                                                                                                                                                                                                                                                                                                                                                  * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protected int labelFont;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protected String label;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protected Font 1Font;
                                                                                                                                                                                                                                                                                                                      actually a tree node.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protected int id;
package caps.Psdl;
                                                                                                                                                                                                                                                                                                                                                                                                                 * @version
```

b.setText (" " + b.getText ().substring (0, b.getText
().length () - 4) + " ");

} // End of the class VertexProperties

```
// Calls DefaultMutableTreeNode's add method
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Sets the label of this component to the specified value.
                                  // Sets the parent Vertex
// If not the root operator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Sets the id of this component to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Returns the x-component of the offset of the label.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Returns the label of this component.
  // I think I don't need v any more
                                                                                                                                                                                                                                                                                                                                                                                                         * Returns the id of this component.
                                                                                                                                                                                                                                  //public Vertex getParentVertex ()
                                                                                          v.setAllowsChildren (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public int getLabelXOffset ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public void setLabel (String
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public String getLabel ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public void setId (int i)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   return labelXOffset;
                                                         if (v != null) {
                                                                                                                   v.add (this);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                public int getId ()
                                                                                                                                                                                                                                                                                              return parent;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return label;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      label = s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return id;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        id = i;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // The real font to display on the
                                                                                                                                                                                                                                                                                       * The x-offset of the met label from the center of this component.
                                                                                                                                                                                                                                                                                                                                                                                                                                     * The y-offset of the met label from the center of this component.
                                                                                                                                          * The font parameter of the met label of this component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        The parent vertex of this component
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * The font representation of the met (or latency).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           lFont = new Font ("Courier", Font.PLAIN, 12);
metlFont = new Font ("Courier", Font.PLAIN, 12);
* The met of a Vertex or the latency of a Stream.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protected DataFlowComponent (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * The constructor for this class.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * The parent of this component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setAllowsChildren (false);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             //protected Vertex parent;
                                                                                                                                                                                                                                                                                                                                               protected int metXOffset;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protected int metYOffset;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            protected Font metlFont;
                                                       protected PSDLTime met;
                                                                                                                                                                                                         protected int metFont;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            metYOffset = -40;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 labelXOffset = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           labelYOffset = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             metXOffset = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        labelFont = 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   metFont = 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * @param v
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          super ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          screen
```

```
to the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Sets the y-component of the offset of the met (or latency) to the
                                                                                                                                                                                                                                                                         ^{\star} Returns the x-component of the offset of the met (or latency).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Returns the y-component of the offset of the met (or latency).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ^{\star} Changes the met (or latency) offset to the specified x and y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Sets the x-component of the offset of the met (or latency)
* Returns the met (or latency) of this component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public void setMetOffset (int xOffset, int yOffset)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          metXOffset = metXOffset + xOffset;
metYOffset = metXOffset + yOffset;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public void setMetXOffset (int xLoc)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void setMetYOffset (int yLoc)
                                                                                                                                                                                                                                                                                                                                           public int getMetXOffset ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public int getMetYOffset ()
                                                                    public PSDLTime getMet ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        metYOffset = yLoc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               return metYOffset;
                                                                                                                                                                                                                                                                                                                                                                                                                   return metXOffset;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     metXOffset = xLoc;
                                                                                                                                         return met;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         values.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Sets the met (or latency) of this component to the specified value.
                                * Sets the x-component of the offset of the label to the specified
                                                                                                                                                                                                                                                                                                                                         * Sets the y-component of the offset of the label to the specified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Changes the label offset to the specified x and y values.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Returns the y-component of the offset of the label.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public void setLabelOffset (int xOffset, int yOffset)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         labelXOffset = labelXOffset + xOffset;
labelYOffset = labelYOffset + yOffset;
                                                                                                                                public void setLabelXOffset (int xLoc)
                                                                                                                                                                                                                                                                                                                                                                                                                                              public void setLabelYOffset (int yLoc)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public void setMet (PSDLTime s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Returns font of the label.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public int getLabelYOffset ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    return labelYOffset;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public Font getlFont ()
                                                                                                                                                                                                        labelXOffset = xLoc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                labelYOffset = yLoc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return lFont;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              met = s;
```

```
Integer.parseInt (FontConstants.FONT_VALUES [(f
                                                                                                                              * Changes the met (or latency) font index to the specified value.
                                                                                                                                                                                                                                                                                                                                                        ? Font.PLAIN : Font.BOLD);
metlFont = new Font (FontConstants.FONT_VALUES [(f - 1) * 3],
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Returns the met (or latency) font index of this component.
                                                                                                                                                                                                                                                    metFont = f;
int type = ((FontConstants.FONT_VALUES [(f - 1) * 3
1].equals("Plain"))
                                                                                                                                                                                          public void setMetFontIndex (int
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      } // End of class DataFlowComponent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public int getMetFontIndex ()
                                                                                                                                                                                                                                                                                                                                                                                                                                 type,
return labelFont;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          return metFont;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1) * 3 + 2]));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Integer.parseInt (FontConstants.FONT_VALUES [(f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ? Font.PLAIN : Font.BOLD);

1Font = new Font (FontConstants.FONT_VALUES [(f - 1) * 3],
                                                                                                                                                                                                                                                                                                                      * This abstract method is implemented in the subclasses.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * This abstract method is implemented in the subclasses.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * This abstract method is implemented in the subclasses.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Changes the label font index to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public abstract void moveTo (int xOffset, int yOffset);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         labelFont = f;
int type = ((FontConstants.FONT_VALUES [(f - 1) * 3
1].equals("Plain"))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * Returns the label font index of this component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Returns the name (label) of this component.
                                                         * Returns font of the met (or latency).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public void setLabelFontIndex (int
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public int getLabelFontIndex ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public abstract int getY ();
                                                                                                                                                                                                                                                                                                                                                                                     public abstract int getX ();
                                                                                                                        public Font getMetlFont ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public String toString ()
                                                                                                                                                                                          return metlFont;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return label;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1) * 3 + 2]));
```

```
while ((tokType = tok.nextToken ()) != StreamTokenizer.TT_EOF) {
                                                        if (str.equalsIgnoreCase ("boolean") || str.equalsIgnoreCase
                                                                                                                                                                                                                                                                                                                                                                                 // this is called when reafing form the file for the first time
                                                                                                                   str.equalsIgnoreCase ("string") || str.equalsIgnoreCase
                                                                                                                                                                          str.equalsIgnoreCase ("real") || str.equalsIgnoreCase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               tok = new StreamTokenizer (new FileReader (file));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tok = new StreamTokenizer (new StringReader (s));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (tokType == StreamTokenizer.TT_WORD &&
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 tempStr = getNextToken (tok);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 // called when building types in the editor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  tempStr = getNextToken (tok);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             private void build (StreamTokenizer tok)
public boolean isPredefined (String str)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           } catch (FileNotFoundException ex) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           types.addElement (str);
                                                                                                                                                                                                                                                                                                                                                                                                           public void buildTypes (File file)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void buildTypes (String s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tok.sval.equalsIgnoreCase ("TYPE"))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     tok.eollsSignificant (true);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        System.out.println (ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    StreamTokenizer tok = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      StreamTokenizer tok = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                tok.wordChars (33, 126);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       str = tempStr;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           removeElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     int counter = 0;
                                                                                                                                                                                                                                                                                              return false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      String tempStr;
                                                                                                                                                                                                                                     return true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       build (tok);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             build (tok);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         int tokType;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         String str;
                                                                                                                                                                                                         ("exception"))
                                                                                       ("character")
                                                                                                                                                ("integer")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                try (
                                                                                                                                                                                                                                                                  else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        for (Enumeration enum = types.elements (); enum.hasMoreElements ();)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void addType (String name, String spec, String impl)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (name.equals((String) enum.nextElement ()))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       // This will be called when a new edge is created
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               impls.addElement ("ada " + name + "\nEND");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (!exists (name) && !isPredefined (name)) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // This will be called from the builder
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public boolean exists (String name)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       specs.addElement ("\nEND");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public void addType (String name)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (name);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (spec);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           types.addElement (name);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          impls.addElement (impl);
                                                      import java.util.Vector;
import java.util.Enumeration;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        impls = new Vector ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         boolean flag = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           specs.addElement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 types.addElement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (!exists (name))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      types = new Vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           specs = new Vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  flag = true;
                                                                                                                                                                                                                                   private Vector types;
                                                                                                                                                                                                                                                                                                                                                    private Vector impls;
                                                                                                                                                                                                                                                                                            private Vector specs;
                                                                                                                                                                        public class DataTypes
                                                                                                                                                                                                                                                                                                                                                                                                           public DataTypes ()
package caps.Psdl;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return flag;
                                                                                                                 import java.io.*;
```

```
str = str.concat ("IMPLEMENTATION " + (String) impls.elementAt
                                                                                                                                                                                                                                                                                                        str = str.concat ("SPECIFICATION " + (String) specs.elementAt
                                                                                                                                                                                                                                              str = str.concat ("TYPE " + (String) types.elementAt (ix)
                                                                                                                                                                                    int numberOfTypes = types.size ();
for (int ix = 0; ix < numberOfTypes; ix++) {</pre>
         impls.removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              } // End of the class DataTypes.
                                                                                             public String toString
                                                                                                                                                          String str = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                               return str;
                                                                                                                                                                                                                                                                                                                                                                                            (ix) + "\n\n");
                                                                                                                                                                                                                                                                                                                                  (ix) + "(n");
                                                                                                                                                                                                                                                                                "\n");
                                                                                                                                                                                                                                                                                                                                                             } while (counter > 0 || !tempStr.equalsIgnoreCase ("END"));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      } while (counter!= 0 || !tempStr.equalsIgnoreCase ("END"));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                } while (!tempStr.equalsIgnoreCase ("IMPLEMENTATION"));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public String getNextToken (StreamTokenizer tok) throws IOException
} while (!tempStr.equalsIgnoreCase ("SPECIFICATION"));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (tempStr.equalsIgnoreCase ("IMPLEMENTATION"))
                                                                                                                                                if (tempStr.equalsIgnoreCase ("SPECIFICATION"))
                                                                                                                                                                                                          else if (tempStr.equalsIgnoreCase ("END"))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else if (tempStr.equalsIgnoreCase ("END"))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        else if (tok.ttype == StreamTokenizer.TT_WORD)
                                                                                                                        tempStr = getNextToken (tok);
                                                                                                                                                                                                                                                                                                                                                                                                                                                      tempStr = getNextToken (tok);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         tempStr = getNextToken (tok);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (tok.ttype == StreamTokenizer.TT_EOL)
                                                                                                                                                                                                                                                                 str = str.concat (tempStr);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  str = str.concat (tempStr);
                                                                                                                                                                                                                                                                                                                                  str = str.concat (" ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 str = str.concat (" ");
                                                                                                                                                                                                                                                                                                   if (tempStr != "\n")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        impls.addElement (str);
                                                                                                                                                                                                                                                                                                                                                                                            specs.addElement (str);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (tempStr != "\n")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            str = str.concat (tok.sval);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            System.out.println (ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         types.removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 specs.removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 } catch (IOException ex) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public void removeElements ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               counter--;
                                                                                                                                                                                    counter++;
                                                                                                                                                                                                                                              counter--;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   counter++;
                                                            counter++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             counter++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      tok.nextToken ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       String str = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    str = " \setminus n";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return str;
```

```
* Relocates the stream when the stream is moved with other objects.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                for (Enumeration enum = points.elements (); enum.hasMoreElements
                                                                                                                                                                                                               * The index of the handle that the mouse is pressed on.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        points = new Vector (0, 2);
points.addElement (new Point (xLocation, yLocation));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public Edge (int xLocation, int yLocation, Vertex v)
                                                       * The y location of this stream in the DrawPanel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  setLabel ("unnamed_stream_" + UNIQUE_ID++);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public void moveTo (int xOffset, int yOffset)
                                                                                                                                                                                                                                                                                                                                                                                                                                    * @param v the parent vertex of this edge.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               p = (Point) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                         * The constructor for this class.
                                                                                                                                                                                                                                                                                 protected int selectedHandleIndex;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                streamType = "undefined_type";
initialValue = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                p.x = p.x + xOffset,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            p.y = p.y + yoffset;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           correctLabelOffset ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            destination = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     setX (xLocation);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              id = ++UNIQUE_ID;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    setY (yLocation)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           isState = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              source = null;
                                                                                                                      protected int y;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          met = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  super (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Point p;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ) (()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * The vector that holds the control points of this stream.
                                                                                                                                                                                                                                                                                                             * Edge represents a stream in the data flow diagram
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * The x location of this stream in the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public class Edge extends DataFlowComponent {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * The destination Vertex of this stream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * The source Vertex of this stream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * The initial value of the stream.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                * True if this is a state stream.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                * The type name of the stream
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protected String initialValue,
                                                                                                                                                                                                                                                                                                                                        * It is also a TreeNode object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protected Vertex destination;
                                                                                                                                                                                 import java.io.StreamTokenizer;
import java.io.IOException;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protected String streamType;
                                                       import java.util.Vector;
import java.util.Enumeration;
                                                                                                                                                                                                                                                                                                                                                                                                        Gauthor Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             protected boolean isState
                                                                                                                                                     import java.io.StringReader;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      protected Vertex source;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     protected Vector points;
                                                                                                                      import java.awt.Point;
package caps.Psdl;
                                                                                                                                                                                                                                                                                                                                                                                                                                         * @version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        271
```

**/

protected int x;

```
* Adds a new point to the control points. Also adds the middle point
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Sets the initial value of this stream to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Point p = (Point) points.lastElement (); // the last element Point middle = new Point ((x + p.x) / 2, (y + p.y) / 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * @param x the x component of the new conrol point.
* @param y the y component of the new conrol point.
                                                                                                                                                                                                                                                                                                                                                                                                    * Changes the isState field to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Returns the initial value of this stream.
                                                                                                                          * Returns true if this is a state stream.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public void setStateStream (boolean flag)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void setInitialValue (String str)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                points.addElement (new Point (x, y));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public void addPoint (int x, int y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public String getInitialValue ()
                                                                                                                                                                                                public boolean isStateStream ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  points.addElement (middle);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     return initialValue;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          initialValue = str;
streamType = type;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             of the control points.
                                                                                                                                                                                                                                                                    return isState;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         isState = flag;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       **/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Sets the destination Vertex of this stream to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Sets the source Vertex of this stream to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Sets the type of this stream to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Returns the destination Vertex of this stream.
                                                                                                                                                                                                                                                                    * Returns the source Vertex of this stream.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public void setStreamType (String type)
  * Returns the y value of this stream.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void setDestination (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Returns the type of this stream.
                                                                                                                                  return y; // **** Pending ****
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public void setSource (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public Vertex getDestination ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public String getStreamType ()
                                                                                                                                                                                                                                                                                                                                        public Vertex getSource ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return destination;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return streamType;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 destination = v;
                                                                      public int getY ()
                                                                                                                                                                                                                                                                                                                                                                                                               return source;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   source = v;
```

```
StreamTokenizer tok = new StreamTokenizer (reader);
                                                                      StringReader reader = new StringReader (exp);
     exp = exp.substring (1, exp.length () - 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public void delete (boolean deletingInEdge)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (destination instanceof External) {
                                                                                                                                                                                                                                                                  tok.nextToken ();
source.setX ((int) tok.nval);
                                                                                                                                                                                                                                                                                                                                                           source.setY ((int) tok.nval);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          destination.removeInEdge (this);
                                                                                                                                                                                                 if (source instanceof External)
                                                                                                                                                                                                                                                                                                                                                                                                                                  System.out.println (ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               source.removeOutEdge (this)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             int x = (int) tok.nval;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              int y = (int) tok.nval;
                                                                                                                                                                                                                                                                                                                                                                                                } catch (IOException ex)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    System.out.println (ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ) catch (IOException ex) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          tok.nextToken ();
                                                                                                                                                                                                                                                                                                                                      tok.nextToken ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    correctEndingPoints ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           addPoint (x, y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Deletes this stream,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (deletingInEdge)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            deleteHelper ();
                                       exp.trim ();
                                                                                                                                int tokType;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 try
                                                                                                                                                                                                                                                                                                                                                                                                                               // The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Locates the ending points of this stream on the perimeter of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Called to extract a string representation of the control points.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Point p1 = source.getIntersectionPoint ((Point) points.elementAt
                                                                                                                                                                                                                                                        * Sets the location of this stream to the middle control point.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          middle.setLocation ((pl.x + p3.x) / 2, (pl.y + p3.y) / 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        middle = (Point) points.elementAt (points.size () - 2);
middle.setLocation ((p2.x + p3.x) / 2, (p2.y + p3.y) / 2);
correctLabelOffset ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Constructs the points vector from the string expression.
                                                                                                                                                                                                                                                                                                                                                                                                                       Point p = (Point) points.elementAt (points.size () / 2);
                                                                                                                                                                                                                                                                                                                         // Pending this is called by so many methods needlessly
public void correctLabelOffset ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Point p2 = destination.getIntersectionPoint ((Point)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           p3 = (Point) points.elementAt (points.size () - 3);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         points.setElementAt (p2, points.size () - 1);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  // called to build the points vector
public void setInitialControlPoints (String exp)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // ikinci ve sondan ikinci elemanlar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                middle = (Point) points.elementAt (1);
* Returns the control points vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 p3 = (Point) points.elementAt (2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    setX (p.x + 10); setY (p.y - 10);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 points.elementAt (points.size () - 2));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public void correctEndingPoints ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  points.setElementAt (p1, 0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   points.removeAllElements ();
                                                      public Vector getPoints ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                       middle point in the vector
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      source and destination.
                                                                                                                             return points;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Point middle;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          **/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (1);
```

274

```
while ((tokType = tok.nextToken ()) != StreamTokenizer.TT_EOF)
points.addElement (new Point (source.getX (), source.getY ()));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               destination.setX (((Point) points.lastElement ()).x);
destination.setY (((Point) points.lastElement ()).y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        addPoint (destination.getX (), destination.getY ());
```

```
public External (int xLocation, int yLocation, Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public Point getIntersectionPoint (Point p)
                                                                                                                                                                                                   super (xLocation, yLocation, v, false);
                                                                                               public class External extends Vertex {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return new Point (x, y);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  } // End of the class External
                                                                                                                                                                                                                                                                          setLabel ("EXTERNAL");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      removeFromParent ();
                                                                                                                                                                                                                                                                                                                         labelYOffset = 10;
                                              import java.awt.Point;
                                                                                                                                                                                                                                                                                                                                                                          x = xLocation;
                                                                                                                                                                                                                                                                                                                                                                                                    y = yLocation;
width = 0;
package caps.Psdl;
                                                                                                                                                                                                                                                    met = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     height = 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       for (Enumeration enum = parent.children (); enum.hasMoreElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DataFlowComponent dfc = (DataFlowComponent) enum.nextElement
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              // of this child in the if (dfc instanceof Edge && ((Edge) dfc).isStateStream ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ((Vector) ((Vertex) parent).getSpecReqmts ().elementAt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (destination instanceof External)
                                                                                                                                                                                                                                                                              * Helper method to delete the stream
                                                                                                                    source.removeOutEdge (this);
destination.removeInEdge (this);
deleteHelper ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   if (source instanceof External)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (dfc.equals (this))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            // trying to find index
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          destination.delete ();
                                                                                                                                                                                                                                                                                                                           public void deleteHelper ()
                                                                                                                                                                                                                                                                                                                                                                              if (isStateStream ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (2)).removeElementAt (index);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         break label;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      } // End of the class Edge.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           source.delete ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  removeFromParent ();
                        * Deletes this stream.
                                                                                                                                                                                                                                                                                                                                                                                                  int index = -1;
                                                                       public void delete ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              index++;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               // parent's children
                                                                                                                                                                                                                                                                                                                                                                                                                                 label:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (;;)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .
.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          275
```

```
276
```

```
* Sets the time value to the specified argument.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Sets the time unit to the specified argument.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Sets the time unit to the specified argument.
                                                                                                                                                                                                                                                                                                                                                                                                                       * Returns the time time value of this object.
                                                                                                                                                                                                                                                 public PSDLTime(int timeValue, int timeUnits)
                                                                                                                                                                   * @param timeValue the value of the time. * @param timeUnits the unit of the time.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public void setTimeValue(int timeValue) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Returns the time units of this object.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public void setTimeUnits(int timeUnits) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public void setTimeUnits (String u)
                                                                                                           * The constructor for this class.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public int getTimeValue() {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public int getTimeUnits() {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   units = ms;
else if (u == "sec")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               units = microsec;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (u == "microsec")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          else if (u == "ms")
                                                                                                                                                                                                                                                                                 value = timeValue;
units = timeUnits;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      value = timeValue;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           units = timeUnits;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  return units;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return value;
  units = ms;
                                                                            * This class represents a combination of time value from an integer that
                                                                                                           represents
* the time and another integer that represents the unit.
                                                                                                                                                                                                                                                                                                                                                          * The constant value for microseconds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * The constant value for miliseconds.
                                                                                                                                                                                                                                                                                                                                                                                                                  public final static int microsec = 0;
                                                                                                                                                                                                                                                                          public class PSDLTime extends Object
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * The constant value for seconds.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * The constant value for minutes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * The constructor for this class.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public final static int hours = 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * The constant value for hours.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public final static int sec = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public final static int min = 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public final static int ms = 1;
                                                                                                                                                                                         * @author Ilker DURANLIOGLU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * The value of the time.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * The units of the time.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public PSDLTime() {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        private int units;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  private int value;
package caps.Psdl;
                                                                                                                                                                                                                    * @version
```

```
\star This class represents a terminator or an operator. 
 \star It holds the data structures that represent the constructs for the
                                                                                                             import java.io.BufferedReader;
                                                                                                                                                                                                                                                                                                                                * @author Ilker DURANLIOGLU
                                                                                                                                          java.io.StringReader;
                                                                                                                                                               import java.io.IOException;
                                                                                        java.awt.Point;
                                              import java.awt.Font;
                                                                     import java.util.*;
package caps.Psdl;
                                                                                                                                                                                                                                                                                                                                                   * @version
                                                                                      import
                                                                                                                                                                                                                                                                                      Vertex.
                                                                                                                                          Import
                                                                                                                                                                                                                                  ^{\star} Greturn the string representation in the form of "12 sec"
                                                                                                                                                                                      * Returns a string representation of this object.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     return String.valueOf(value) + " " + unitString;
                                                                                                                                                                                                                                                                                                                                                       case microsec : unitString = "microsec";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           default : unitString = "undefined";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               case hours : unitString = "hours";
                                                                                                                                                                                                                                                                                                                                                                                                                                               case sec : unitString = "sec";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 case min : unitString = "min";
                                                                                                                                                                                                                                                                                                                                                                                                     case ms : unitString = "ms";
                                                                                                                                                                                                                                                                                  public String toString() {
                                                                 else if (u == "hours")
units = hours;
units = sec;
else if (u == "min")
                                                                                                                                                                                                                                                                                                         String unitString;
switch (units) (
                                                 units = min;
                                                                                                                                                                                                                                                                                                                                                                                  break;
                                                                                                                                                                                                                                                                                                                                                                                                                              break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     277
```

} // End of the class PSDLTime

```
protected Vector mrtRegmts;
* The constant value for Vertices that have "BY ALL" triggering
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ^{\ast} It serves as the radius of an operator and the width of a terminator width of operator .cap
                                                                                                                                                                                                                                                                                                                                       * The x-location of this component on the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ^{\star} The y-location of this component on the DrawPanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * The color parameter of this component.
                                                                                                                                                                                * True if this Vertex is a terminator.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protected Vector finishWithinRegmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * The height of this component.
                                                                                      public static final int BY_ALL =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * The width of this component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   protected PSDLTime finishWithin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protected Vector periodReqmts;
                                                                                                                                                                                                                                              protected boolean terminator;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protected Vector metRegmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protected Vector mcpRegmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protected PSDLTime period;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protected PSDLTime mcp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 protected PSDLTime mrt;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  protected int height
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                protected int color;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protected int width;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protected int y;
                                                                                                                                                                                                                                                                                                                                                                                                        protected int x;
                                construct.
```

```
public Vertex (int xLocation, int yLocation, Vertex v, boolean t)
                                                                                                                                                protected Vector triggerStreamsList;
                                                                                                                                                                                                                                                                                                protected String exceptionGuardList;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * The constructor for this class.
                                                                                                                                                                                                                                               protected String outputGuardList;
                                                                                            protected Vector triggerReqmts;
                                                                                                                                                                                                                                                                                                                                              protected String exceptionList;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protected String informalDesc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        protected String genericList;
                                                                                                                                                                                                                                                                                                                                                                                                                                                protected Vector keywordList;
                                                                                                                                                                                                                                                                                                                                                                                                   protected String timerOpList;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protected String impLanguage;
                                                                                                                                                                                                 protected String ifCondition,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protected String formalDesc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protected Vector specRegmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protected String graphDesc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protected Vector timerList;
                                             protected int triggerType;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protected Vector outEdges;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           protected Vector inEdges;
protected int timingType;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        super (v);
```

```
//if this is the root
                                                                                                                                                                                                                                                                                                                                                                           else if (isTerminator ()) {
    setLabel ("terminator..." + UNIQUE_ID++);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  setLabel ("operator_" + UNIQUE_ID++);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      finishWithinRegmts = new Vector (0, 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       triggerStreamsList = new Vector (0, 2);
                                                                                                                                                                                                                                                                                                                          setLabel ("root_" + UNIQUE_ID++);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            mcpRegmts = new Vector (0, 2);
mrtRegmts = new Vector (0, 2);
triggerRegmts = new Vector (0, 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      mnu~do //
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                periodRegmts = new Vector (0, 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          keywordList = new Vector (0, 2);
                                                                                                                           color = 62; // initially white
                                                                                                                                                                           timingType = NON_TIME_CRITICAL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      metRegmts = new Vector (0, 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             setwidth (INITIAL_RADIUS * 2);
                          outEdges = new Vector (0);
                                                                                                                                                                                               triggerType = UNPROTECTED;
                                                                                                                                                                                                                                                                                                                                                                                                                             met = new PSDLTime ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (getParent () == null)
inEdges = new Vector (0);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       outputGuardList = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              exceptionGuardList =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               finishWithin = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 id = ++UNIQUE_ID;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            id = ++UNIQUE_ID;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          exceptionList = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  informalDesc = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  timerOpList = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ifCondition = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     formalDesc = "";
                                                                                                                                                                                                                                                                                                      if (v == null) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        UNIOUE ID++;
                                                                          terminator = t;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       period = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mcp = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               = null;
                                                                                                                                                                                                                                                    met = null;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                else {
```

```
* Gparam xLocation The new x component of the location on the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ' @param yLocation The new y component of the location on the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * @param xLocation The new x component of the location on the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * @param yLocation The new y component of the location on the
                                                                                                                                                                                                                                                                                                                                   y = yLocation; // Set the location of the component
                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Sets the location of this component on the screen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Sets the location of this component on the screen.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Also corrects the location of the ending streams.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Greturn true if this component is a terminator.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Returns true if this component is a terminator.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public void setLocation (int xOffset, int yOffset)
                                                                                                                                               2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public void moveTo (int xOffset, int yOffset)
                                                                                                                     999
                                                                                                                   specReqmts.addElement (new Vector
                                                                                                                                                 speckegmts.addElement (new Vector
                                                                                                                                                                               specReqmts.addElement (new Vector
                                                                                          specRegmts = new Vector (0, 2);
timerList = new Vector (0, 2);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public boolean isTerminator ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              moveTo (xOffset, yOffset);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            correctInOutStreams ();
                                                                                                                                                                                                                                                impLanguage = "ada";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               return terminator;
                                                         genericList = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   x = x + xOffset;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               y = y + yoffset,
                           graphDesc = "";
                                                                                                                                                                                                                                                                                                             x = xLocation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           drawpanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     drawpanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              drawpanel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               drawpanel
                                                                                                                                                                                                                                                                                                                                                                                                                                *
```

```
public void setX (int xLoc)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public void sety (int yLoc)
                                                                                               public int getHeight ()
                                                                                                                                                                                                                                                                                                                                 public int getX ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public int getY ()
                                                                                                                                               return height;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * @param xLoc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * @param yLoc.
                                                                                                                                                                                                                                                                                      * Greturn x
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * @return y
                                                                                                                                                                                                                                                                                                                                                                                  return x;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    x = x \text{Loc};
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    y = yLoc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return y;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for (Enumeration enum = outEdges.elements (); enum.hasMoreElements
                                                                                                                                                                                                                                                                                                                                                                                               for (Enumeration enum = inEdges.elements (); enum.hasMoreElements
                                                                                                                                                                                                                                                                               * Corrects the ending points of the in and out streams of this
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ((Edge) enum.nextElement ()).correctEndingPoints ();
                                                                                                                                                                                                                                                                                                                                                                                                                                             ((Edge) enum.nextElement ()).correctEndingPoints ();
* Sets this component as a terminator or a stream. * Also changes the width of the component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * @param w the new width of this component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Returns the width of this component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Greturn the width of this component.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Changes the width of this component.
                                                                                                                public void setTerminator (boolean b)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              height = (int) (width / 1.4d);
                                                                                                                                                                                                                                                                                                                                                  public void correctInOutStreams ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public void setWidth (int w)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 width = w;
if (isTerminator ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public int getWidth ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             height = width;
                                                                                                                                                              terminator = b;
setWidth (width);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return width;
                                                                   * @param b.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           else
                                                                                                                                                                                                                                                                                                       component.
                                                                                                                                                                                                                                                                                                                                                                                                                          );;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (:)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     280
```

```
* Returns the y component of the location of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ^{\star} Changes the y component of the location of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                    * Returns the x component of the location of this Vertex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ^{\star} Changes the x component of the location of this Vertex
* Returns the height of this component.
                                                                            * Greturn the height of this component.
```

```
// I should throw some
                                                                                                                                                                                                                                                                                                                ((Vector) specRegmts.elementAt (1)).removeElementAt (index);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Sets the triggering type to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Sets the timing type to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               * Returns the triggering type of this Vertex.
                                                               * Removes an Edge from the outEdges Vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Returns the period value of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                        * Returns the timing type of this Vertex.
                                                                                                                        * @param e the outEdge to be removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public void setTriggerType (int type) exceptions here
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void setTimingType (int type)
                                                                                                                                                                                                                                                   int index = outEdges.indexOf (e)
outEdges.removeElementAt (index)
                                                                                                                                                                                     public void removeOutEdge (Edge e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            public int getTriggerType ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public PSDLTime getPeriod ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public int getTimingType ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return triggerType;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                triggerType = type;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   return timingType;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         timingType = type;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return period;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ((Vector) specRegmts.elementAt (0)).removeElementAt (index);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ((Vector) specReqmts.elementAt (1)).addElement ("");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ((Vector) specReqmts.elementAt (0)).addElement ("");
* Changes the color value for this Vertex.
                                                                                                                                                                                                                                                                                                                   * Returns the color value for this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Removes an Edge from the inEdges Vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                * Adds a new Edge to the outEdges Vector.
                                                                                                                                                                                                                                                                                                                                                                           * Greturn the color value of the Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Adds a new Edge to the inEdges Vector.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * @param e the inEdge to be removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           int index = inEdges.indexOf (e);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       in Edges.remove Element At (index);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void removeInEdge (Edge e)
                                                        * Oparam c the new color value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void addOutEdge (Edge e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void addInEdge (Edge e)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Oparam e the new outEdge.
                                                                                                                     public void setColor (int c)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ' @param e the new inEdge.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         outEdges.addElement (e);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         inEdges.addElement (e);
                                                                                                                                                                                                                                                                                                                                                                                                                                           public int getColor ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return color;
                                                                                                                                                                                        color = c;
```

```
282
```

```
* Returns the finish within value of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Sets the finish within to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Sets the period to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                             * Returns the mrt value of this Vertex.
                                                                                                                                                                                                               * Returns the mcp value of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void setFinishWithin (PSDLTime fw)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Sets the mrt to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Sets the mcp to the specified value.
                                                   public PSDLTime getFinishWithin ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public void setPeriod (PSDLTime p)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public void setMcp (PSDLTime m)
                                                                                                                                                                                                                                                                public PSDLTime getMcp ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public PSDLTime getMrt ()
                                                                                                      return finishWithin;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              finishWithin = fw;
                                                                                                                                                                                                                                                                                                                        return mcp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 period = p;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return mrt;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mcp = m;
```

```
* Sets the implementation language to the specified value.
                                                                                                                                                              * Returns the implementation language of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Sets the period regirements to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Sets the met requirements to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * Returns the period requirements of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Returns the met requirements of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public void setPeriodRegmts (Vector v)
                                                                                                                                                                                                                                                                                                                                                                                                                                   public void setImpLanguage (String s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public void setMetRegmts (Vector v)
public void setMrt (PSDLTime mr)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public Vector getPeriodRegmts ()
                                                                                                                                                                                                                  public String getImpLanguage ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public Vector getMetRegmts ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    return periodRegmts;
                                                                                                                                                                                                                                                                         return impLanguage;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            return metReqmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       periodReqmts = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              impLanguage = s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      metReqmts = v;
                                                         mrt = mr;
```

```
' Sets the trigger streams list to the specified value.
                                                                                                                                                                                              * Sets the trigger requirements to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Returns the triggering streams of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Sets the if condition to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            * Returns the output guard list of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public void setTriggerStreamsList (Vector v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Returns the if condition of this Vertex.
                                                                                                                                                                                                                                                           public void setTriggerReqmts (Vector v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public Vector getTriggerStreamsList ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void setIfCondition (String s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public String getOutputGuardList ()
public Vector getTriggerReqmts ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public String getIfCondition ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           return triggerStreamsList;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         triggerStreamsList = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return outputGuardList;
                                                                  return triggerRegmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               return ifCondition;
                                                                                                                                                                                                                                                                                                                             triggerReqmts = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ifCondition = s;
                                                                                                                                                                                                                                                                                                                             * Sets the finish within requirements to the specified value.
                                                                  * Returns the finish within requirements of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Sets the mrt requirements to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Sets the mcp requirements to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Returns the trigger requirements of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    * Returns the mrt requirements of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Returns the mcp requirements of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                          public void setFinishWithinReqmts (Vector v)
                                                                                                                              public Vector getFinishWithinRegmts ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public void setMcpReqmts (Vector v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public void setMrtReqmts (Vector v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public Vector getMrtRegmts ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public Vector getMcpReqmts ()
                                                                                                                                                                                              return finishWithinReqmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            finishWithinReqmts = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      return mrtReqmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          return mcpReqmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        mcpReqmts = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    mrtReqmts = v;
```

```
* Sets the exception guards list to the specified value.
* Sets the output guard list to the specified value.
                                                                                                                                                                                                                                                           * Returns the exception guard list of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Sets the exception list to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Sets the timer op list to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   * Returns the exception list of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       * Returns the timer op list of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public void setExceptionGuardList (String s)
                                                         public void setOutputGuardList (String s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public void setExceptionList (String s)
                                                                                                                                                                                                                                                                                                                         public String getExceptionGuardList ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public String getExceptionList ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public String getTimerOpList ()
                                                                                                                                                                                                                                                                                                                                                                                           return exceptionGuardList;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   exceptionGuardList = s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    return exceptionList;
                                                                                                                          outputGuardList = s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          return timerOpList;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 exceptionList = s;
```

```
* Sets the informal description to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Sets the formal description to the specified value.
                                                                                                                                                              * Returns the informal description of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Returns the formal description of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * Sets the keywords to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Returns the keywords of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                               public void setInformalDesc (String s)
public void setTimerOpList (String s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public void setKeywordList (Vector v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public void setFormalDesc (String s)
                                                                                                                                                                                                               public String getInformalDesc ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public Vector getKeywordList ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public String getFormalDesc ()
                                                                                                                                                                                                                                                                     return informalDesc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return keywordList;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return formalDesc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       informalDesc = s;
                                                   timerOpList = s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       keywordList = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     formalDesc = s;
```

```
* Returns intersection point of this vertex with the specified point.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .. * Called from getIntersectionPoint when this Vertex is a Terminator
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         * Returns the intersection point of this vertex with the specified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Returns the intersection point of this vertex with the specified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 * Called from getIntersectionPoint when this Vertex is an Operator.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       slope = (float) (p.y - getY ()) / (float) (p.x - getX ());
if (Math.abs (slope) >= (1 / 1.4f)) {
   if (p.y <= getY () - getHeight () / 2)
   y = getY () - getHeight () / 2;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               y = getY () + getHeight () / 2;
x = (int) ((float) (y - getY ()) / slope) + getX ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        x = getX () + getWidth () / 2;
y = (int) ((float) (x - getX ()) * slope) + getY ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public Point getTerminatorIntersection (Point p)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public Point getOperatorIntersection (Point p)
                                                                                                                                                                                                                                                                                                                                                                                       return getTerminatorIntersection (p);
                                                                                                                                                                                                                                                                          public Point getIntersectionPoint (Point p)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (p.x <= getX () - getWidth () / 2)
x = getX () - getWidth () / 2;</pre>
                                                                                                                                                                                                                                                                                                                                                                                                                                                        return getOperatorIntersection (p);
public Vector getSpecReqmts ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                return new Point (x, y);
                                                                                                                                                                                                                                                                                                                                           if (isTerminator ())
                                                                      return specRegmts;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         float slope;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   int x;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Returns the infornmal graph description of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     * Sets the graph description to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             * Sets the generic list to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          * Returns the spec requirements of this Vertex.
                                                                                                                                                                                                                                                                                                                                           * Sets the timer list to the specified value.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Returns the generic list of this Vertex.
                                                                   * Returns the timers of this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public void setGenericList (String s)
                                                                                                                                                                                                                                                                                                                                                                                                              public void setTimerList (Vector v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public void setGraphDesc (String s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public String getGenericList ()
                                                                                                                                   public Vector getTimerList ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public String getGraphDesc ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         return genericList;
                                                                                                                                                                                                         return timerList;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return graphDesc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         generichist = s;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    timerList = v;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               graphDesc = s;
```

```
STATES " + ((Edge) d).getLabel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KEYWORDS " + extractList (keywordList)
                               OUTPUT " + e.getLabel () + " :
                                                                                                                                                                                                                                                                                                                                                                                               DataFlowComponent d = (DataFlowComponent) enum.nextElement ();
if (d instanceof Edge && ((Edge) d).isStateStream ()) {
   if (state.lastIndexOf (" " + ((Edge) d).getLabel () + " ")
                                                                                                                                                                                                                                                                                                                                                               for (Enumeration enum = children (); enum.hasMoreElements ();) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      REQUIRED BY " + tmp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if ((tmp = (String) en.nextElement ()).length () != 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REQUIRED BY " + extractList
                                                                                             if ((tmp = (String) en.nextElement ()).length () != 0)
output = output.concat (" REQUIRED BY " + tmp
if (output.lastIndexOf (" " + e.getLabel () + " ") == -1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  spec = spec.concat (extractString (exceptionList, false));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  spec = spec.concat (extractString (informalDesc, false));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 + ((Edge) d).getStreamType ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         + ((Edge) d).getInitialValue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (extractString (formalDesc, false));
                                                                                                                                                                                                                                                                                                 en = ((Vector) specRegmts.elementAt (2)).elements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MAXIMUM EXECUTION TIME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 System.out.println (spec + "\n" + ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      state = state.concat ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (exceptionList.length () != 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      state = state.concat ("
                               output = output.concat ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          if (informalDesc.length () != 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (formalDesc.length () != 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               if (!metReqmts.isEmpty ())
                                                                                                                                                                                                                                                                    spec = spec.concat (output);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (keywordList.size () > 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             spec = spec.concat ("
(metReqmts) + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     spec = spec.concat (state);
                                                               " + e.getStreamType () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  spec = spec.concat ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  spec = spec.concat ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 catch (Exception ex) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 spec = spec.concat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               spec = spec.concat ("
                                                                                                                                                                                                                                                                                                                                 String state = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  met.toString () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (met != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 return spec;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INITIALLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   : <u>-</u> + ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ("u\" +
                                                                                                                                                               "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -1) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                // Because otherwise it allows more
                               // Distance from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              * Greturn returns the string representation of the specification of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for (Enumeration enum = outEdges.elements (); enum.hasMoreElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           spec = spec.concat ("OPERATOR " + getLabel () + "_" + getId ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          for (Enumeration enum = inEdges.elements (); enum.hasMoreElements
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INPUT " + e.getLabel () + " :
                                                                                                                                                            () / 2) / distance)
                                                                                          () / 2) / distance)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if ((tmp = (String) en.nextElement ()).length () != 0)
input = input.concat (" REQUIRED BY " + tmp +
                                                                                                                               (p.x - getX ()));
                                                                                                                                                                                               * (float) (p.y - getY ()));
                                                                                                                                                                                                                                                                                                                                                            * Creates the specification construct from its data structures.
                                                                                                                                                                                                                                                                                                                                                                                                                                 * @param hasId boolean value that specifies if this Vertex has
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       if (input.lastIndexOf (" " + e.getLabel () + " ") == -1) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             spec = spec.concat ("OPERATOR " + getLabel () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             en = ((Vector) specRegmts.elementAt (0)).elements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              en = ((Vector) specReqmts.elementAt (1)).elements ();
                               double distance = p.distance (getX (), getY ());
                                                                                       int x = getX () + (int) (((double) (getWidth
                                                                                                                                                            int y = getY () + (int) (((double) (getWidth
                                                                                                                               * (float)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        spec = spec.concat (genericList + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public String getSpecification (boolean hasId)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SPECIFICATION\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Edge e = (Edge) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Edge e = (Edge) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (genericList.length () != 0 )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       input = input.concat ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            spec = spec.concat (input);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          than one input or output *****
                                                                                                                                                                                                                            return new Point (x, y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           spec = spec.concat ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            e.getStreamType () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            String output = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             String input = "";
                                                             the point to the center
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Enumeration en;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              String spec =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              String tmp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (hasId)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            this Vertex.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 unique id.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \mathbb{C}
```

286

```
DataFlowComponent dfc = (DataFlowComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                         for (Enumeration enum = outEdges.elements (); enum.hasMoreElements
                                                                                                                                                                    for (Enumeration enum = inEdges.elements (); enum.hasMoreElements
for (Enumeration enum = children (); enum.hasMoreElements ();) (
                                                                                                                                                                                                                                                                                                                                           ((Edge) enum.nextElement ()).delete (false);
                                                                                                                                                                                                                                        ((Edge) enum.nextElement ()).delete (true);
                                                                 if (dfc instanceof Vertex)
  ((Vertex) dfc).delete ();
                                                                                                                                                                                                                                                                                                                                                                                                          outEdges.removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                         inEdges.removeAllElements ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 } // End of the class Vertex
                                                                                                                                                                                                                                                                                                                                                                                                                                                removeFromParent ();
                                                                                                                                                                                                          <u>;</u>
                                                                                                                                                                                                                                                                                                          (;
(;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Deletes all the children of this Vertex and also deletes all the in
                                                                                                                                                                                                                                      BufferedReader reader = new BufferedReader (new StringReader (str));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               str = str.concat (", ").concat ((String) enum.nextElement ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             // from exceptions formal and informal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ಥ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      * Extracts an idList which is represented as a Vector and returns
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * of the idList so that it will have the form "id1, id2, id3..."
                                                                       * Extracts the string parameter and reformats it to add to the
                                                                                                                                                                                                                                                                                                                                                                                                          // from exceptionGuardList,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            " + line + "\n");
                                                                                                                                                                 public String extractString (String str, boolean moreSpaces)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                str = new String ((String) enum.nextElement ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              " + line + "\n");
                                                                                                                                                                                                                                                                                                                                                                            while ((line = reader.readLine ()) != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 while (enum.hasMoreElements ()) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public String extractList (Vector v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (enum.hasMoreElements ())
                                   * Called from getSpecification.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    str = str.concat ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              str = str.concat ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ) catch (IOException ex) {
   System.out.println (ex);
                                                                                                                                                                                                                                                                                                                                                                                                                                              outputGuardList and timerOpList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           enum = v.elements ();
                                                                                                                                                                                                                                                                                                                                                                                                               if (moreSpaces)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  * Deletes this Vertex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      public void delete ()
                                                                                                                                                                                                                                                                                                       String line = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Enumeration enum;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           String str = "";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             if (v != null) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          String representation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  else
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       return str;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        return str;
                                                                                                        specification.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and out Edges
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   description
```

```
public static void vertex (Vertex v)
                                                                                                                                                                                                                                                                                     END\n\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GRAPH\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     + (v.getId () - 1) + " ");
                                                                                                                                                                                                                                                          psdlImplementation (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  vertex ((Vertex) d);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (v.getMet () != null)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     controlConstraints (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           edge ((Edge) d);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      vertexProperties (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        writer.write ("\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                      dataFlowDiagram (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DataFlowComponent d;
                           if (v.isLeaf ()) {
  writer.write ("
                                                                                                                                                                                                                             writer.write ("
                                                                                                                                                                                                                                                                                   writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                informalDesc (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             writer.write
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 streams (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              timers (v);
                                                                                   v.getLabel () +
                                                                                                                                                                                                    else {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           if (dfc instanceof Vertex && !(dfc instanceof External))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for (Enumeration enum = root.breadthFirstEnumeration ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             public static void build (Vertex root, DataTypes types)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   writer.write (v.getSpecification (true) + "\n\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             dfc = (DataFlowComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public static void operatorImplementation (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public static void operatorSpecification (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public static void dataTypes (DataTypes types)
                                                                                                                                                                                                                                                                                                                                                                public static void ReInit (StringWriter r)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public static void operator (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           writer.write (types.toString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      operator ((Vertex) dfc);
                                                                                                                                                                                                                                                                                                                                                                                                                         writer = new StringWriter ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     public static String getPsdl ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                operatorImplementation (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   operatorSpecification (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              return writer.toString ();
                                                                                                                                                                                                                                                                                                          static StringWriter writer
                                                                                                                                                                  import java.util.Enumeration;
                                                                                 import java.io.StringReader;
                                                                                                          import java.io.StringWriter;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DataFlowComponent dfc;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              dataTypes (types);
                                                                                                                                                                                         import java.util.Vector;
                                                                                                                                                                                                                                                    public class CreatePsdl
                                                   import java.awt.Point;
package caps.Parser;
                                                                                                                                       import caps.Psdl.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            288
```

```
VERTEX " + v.getLabel () + "_" + v.getId ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         for (Enumeration enum = v.children (); enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for (Enumeration enum = v.children (); enum.hasMoreElements ();)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PROPERTY x = " + v.getX () + " \setminus n");
IMPLEMENTATION " + v.getImpLanguage ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (d instanceof Vertex && !(d instanceof External))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             writer.write (": " + v.getMet ().toString ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       d = (DataFlowComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          d = (DataFlowComponent) enum.nextElement ();
if (d instanceof Edge)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public static void psdlImplementation (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                public static void vertexProperties (Vertex v)
                                                                           "_" + v.getId () + "\n");
writer.write (" END\n\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public static void dataFlowDiagram (Vertex v)
                                                                                                                                                                                                                                                   IMPLEMENTATION\n");
```

```
PROPERTY latency_unit = " +
() == null) ? 1 : e.getMet ().getTimeUnits
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           e.getLabel () + " :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for (Enumeration enum = v.children (); enum.hasMoreElements ();) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            for (Enumeration enum = points.elements (); enum.hasMoreElements
                                                                                                                                                                                                                                                                                                                              PROPERTY latency_x_offset =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (!p.equals (points.firstElement ()) && !p.equals
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  if (str.lastIndexOf (" " + e.getLabel () + " ")
                                                                                                                     PROPERTY label_y_offset =
                                                         PROPERTY label_x_offset =
                                                                                                                                                                            PROPERTY latency_font = "
                                                                                                                                                                                                                                                                                                                                                                                   PROPERTY latency_y_offset
                                                                                                                                                                                                                                                                                                                                                                                                                                               PROPERTY spline = \" ");
PROPERTY label_font = "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            d = (DataFlowComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  writer.write (p.x + " + p.y + " ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (!p.equals (points.firstElement ()))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     if (!p.equals (points.lastElement ()))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        if (e.getDestination () instanceof External)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (e.getSource () instanceof External) (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        p = (Point) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  writer.write (p.x + " " + p.y + " ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             writer.write (p.x + " " + p.y + " ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        p = (Point) points.firstElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  p = (Point) points.lastElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            if (!e.isStateStream ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     p = (Point) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (points.lastElement ())) ( // do nothing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           str = str.concat ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public static void streams (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 if (str.length () == 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         if (d instanceof Edge) (
                            e.getLabelFontIndex () + "\n");
                                                                                                                                                                                                                                                                     ((e.getMet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Edge e = (Edge) d;
                                                                                   e.getLabelXOffset () + "\n");
                                                                                                                                               e.getLabelYOffset () + "\n");
                                                                                                                                                                                                         e.getMetFontIndex () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        writer.write ("\"\n");
                                                                                                                                                                                                                                                                                                                                                                                                                  e.getMetYOffset () + "\n");
                                                                                                                                                                                                                                                                                                                                                        e.getMetXOffset () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DataFlowComponent d;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     e.getStreamType ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     String str = "";
                                                                                                                                                                                                                                                                                                                                                                                     writer.write ("
                                                                                                                                                                              writer.write ("
                                                                                                                     writer.write ("
                                                                                                                                                                                                                                        writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                               writer.write ("
  writer.write ("
                                                           writer.write ("
                                                                                                                                                                                                                                                                                                                         writer.write ("
                                                                                                                                                                                                                                                                                               (()) + "\n");
                            PROPERTY radius = " + (v.getWidth () / 2)
                                                                                                                                                                                                                                                                                                                            PROPERTY met_font = " + v.getMetFontIndex
                                                                                                                                                                                                                                                                                                                                                                                                                  () == null) ? 1 : v.getMet ().getTimeUnits
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Point p = (Point) points.elementAt (points.size () / 2);;
writer.write (" PROPERTY id = " + e.getId () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                writer.write (e.getSource ().getLabel () + "_" + e.getSource
  PROPERTY y = " + v.getY () + " (n");
                                                                                      = " + v.getColor ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               writer.write (": " + e.getMet ().toString () + " ");
if (e.getSource () instanceof External)
                                                                                                                                                                                                                                                                  PROPERTY label_y_offset = "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROPERTY met_y_offset = " +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         writer.write (e.getDestination ().getLabel () + "_" e.getDestination ().getId () + "_" +
                                                                                                                                                                                                         PROPERTY label_x_offset = "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PROPERTY met_x_offset = " +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EDGE " + e.getLabel () + " ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (e.getDestination ().getId () - 1));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PROPERTY is_terminator =
                                                                                                                                                  PROPERTY label_font = "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  writer.write (e.getDestination ().getLabel ());
                                                                                                                                                                                                                                                                                                                                                                                     PROPERTY met_unit = "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (e.getSource ().getId () - 1));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           writer.write (e.getSource ().getLabel ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (e.getDestination () instanceof External)
                                                                                        PROPERTY color
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public static void edgeProperties (Edge
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Vector points = e.getPoints ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               public static void edge (Edge e)
                                                                                                                                                                            v.getLabelFontIndex () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                  (v.getMet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        v.getLabelXOffset () + "\n");
                                                                                                                                                                                                                                                                                                 v.getLabelYOffset () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        writer.write (" -> ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      v.getMetXOffset () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    v.getMetYOffset () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           v.isTerminator () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  writer.write ("\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            edgeProperties (e);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              writer.write ("
                                                                                        Ē
                                                                                                                                                                                                                                                                                                                              writer.write ("
  writer.write ("
                          writer.write ("
                                                                                                                                                                                                           writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                     writer.write ("
                                                                                                                                                    writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ().getId () + "_" +
                                                                                                                                                                                                                                                                       writer.write
                                                                                        writer.write
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  writer.write
                                                                                                                                                                                                                                                                                                                                                                                                                                               (() + "\n");
                                                                                                                                                                                                                                                                                                                                                        () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 else
                                                              ("u\" +
                                                                                                                       "\n");
```

```
writer.write (v.extractList (v.getTriggerStreamsList ()) + "\n");
                                                                                                                                                                                                                                                                                PERIOD " + v.getPeriod ().toString ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FINISH WITHIN " + v.getFinishWithin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MINIMUM CALLING PERIOD " + v.getMcp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REQUIRED BY " + v.extractList
                                                             REQUIRED BY " + v.extractList
                                                                                                                                                                                                                                                                                                                                                                  " + v.extractList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    " + v.extractList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REQUIRED BY " + v.extractList
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       + v.getMrt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MAXIMUM RESPONSE TIME "
                                                                                                                                                                                                                                                                                                                                       != 0)
REQUIRED BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ize () != 0)
REQUIRED BY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (v.getFinishWithinReqmts ().size () !=
                              if (v.getTriggerReqmts ().size () != 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 public static void finishWithin (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public static void outputGuards (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (v.getMcpReqmts ().size () i = 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (v.getMrtReqmts ().size () !=0)
                                                                                                                                                                                                                                                                                                                                 if (v.getPeriodReqmts ().size ()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (v.getFinishWithin () != null) {
                                                                                                                                                                                               public static void period (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (v.getFinishWithinReqmts ()) + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    public static void mcp (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public static void mrt (Vertex v)
                                                                                                                                                                                                                                                    () != null) {
("
                                                                                                                                                                                                                                                                                                                                                                                          (v.getPeriodReqmts ()) + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (v.getMcp () != null)
writer.write (" ...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      if (v.getMrt () != null)
writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (v.getMcpReqmts ()) + " \setminus n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (v.getMrtReqmts ()) + "\n");
                                                           writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  writer.write ("
                                                                                                                                                                                                                                                                                                                                                                  writer.write ("
                                                                                     (v.getTriggerReqmts ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ().toString () + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ().toString () + "\n");
                                                                                                                                                                                                                                                      if (v.getPeriod
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ().toString () + "\n")
                                                                                                                                                                                                                                                                                writer.write
                                                                                                                                                                                                                                                                                                           ( "u\ " +
                                                                                                                                                                                                                                                                                                                                                                                 if (v.getTimerList ().size () != 0)
writer.write (" TIMER " + v.extractList (v.getTimerList ())
                                " + e.getLabel () + " :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OPERATOR " + v.getLabel () + "_" + v.getId
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 for (Enumeration enum = v.children (); enum.hasMoreElements ();)
d = (DataFlowComponent) enum.nextElement ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (d instanceof Vertex && !(d instanceof External))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              if (v.getTriggerType () != Vertex.UNPROTECTED)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TRIGGERED BY ");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CONTROL CONSTRAINTS\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                if (v.getTriggerType () == Vertex.BY_SOME)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         public static void controlConstraints (Vertex v)
                                                                                                                                                                                             DATA STREAM\n");
else if (!e.isStateStream ())
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public static void constraint (Vertex v)
                                str = str.concat (", \n
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public static void trigger (Vertex v)
                                                                                                                                                                                                                                                                                                                                 public static void timers (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              constraint ((Vertex) d);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               writer.write ("SOME ");
                                                                                                                                                                                                                       writer.write (str + "\n");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    writer.write ("ALL ");
                                                                                                                                                                if (str.length () != 0) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         - 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               exceptionGuards (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DataFlowComponent d;
                                                                                                                                                                                             writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      finishWithin (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   outputGuards (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       _" + (v.getId ()
trigger (v);
                                                         + e.getStreamType ());
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 writer.write ("
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            timerOps (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              period (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     mcp (v);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             <u>(</u>2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            else
                                                                                                                                                                                                                                                                                                                                                                                                                                          ; ("u\"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C
```

```
public class GrammarCheck {
package caps.Parser;
                                                          import java.io.*;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                String str = v.getGraphDesc ();
writer.write (v.extractString (str, false));
                                                                                       writer.write (v.extractString (str, true));
                                                                                                                                                                                                                                                                                        if (v.getExceptionGuardList ().length () != 0)
                                                                                                                                                                                                                                                                                                                      String str = v.getExceptionGuardList ();
writer.write (v.extractString (str, true));
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       writer.write (v.extractString (str, true));
                       if (v.getOutputGuardList ().length () != 0) {
                                                                                                                                                                                                                            public static void exceptionGuards (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (v.getTimerOpList ().length () != 0) {
                                                       String str = v.getOutputGuardList ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   public static void informalDesc (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (v.getGraphDesc ().length () != 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    String str = v.getTimerOpList ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public static void timerOps (Vertex v)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               } // End of the class CreatePsdl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       j.Ę
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ī.Ē
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        291
```

```
public static boolean isValid (String str, int kind)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          public static final int INFORMAL_DESCRIPTION = 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           public static final int CHECK_EXCEPTION_LIST = 8;
                                                                                                                                                                                                                                                                                                                                                                                public static final int CHECK_OUTPUT_GUARDS = 6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        public static final int FORMAL_DESCRIPTION = 11;
                                                                                                                                                                                                                                                         public static final int INITIAL_EXPRESSION = 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  public static final int CHECK_PARENT_SPEC = 13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 public static final int CHECK_EXCEPTION_GUARDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PsdlParser.initial_expression ();
                                                                                                                                                                                           public static final int INTEGER_LITERAL = 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              public static final int CHECK_TIMER_OPS = 9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PsdlParser.integer_literal ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       public static final int DATA_TYPE = 12;
                                                                                                                                                                                                                                                                                                                       public static final int EXPRESSION = 5;
                                                                                                                            public static final int TYPE_NAME = 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PsdlParser.type_name ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  reader = new StringReader (str);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    case INITIAL_EXPRESSION :
public static StringReader reader;
                                                           public static final int ID = 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PsdlParser.ReInit (reader);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PsdlParser.id ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         case INTEGER_LITERAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           case TYPE_NAME :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             boolean flag = true;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            switch (kind) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           case ID:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  try (
```

```
return flag;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    if (PsdlParser.getNextToken ().kind != PsdlParserConstants.EOF) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        // If there is not only one id
System.out.println ("Characters encountered after a valid")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           System.out.println ("An error occurred during parsing the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              System.out.println ("Parse exception occurred");
System.out.println (e);
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    System.out.println ("Lexical error occurred");
System.out.println (e);
flag = false;
} catch (Exception e) {
                                                                                                                                                       PsdlParser.check_exception_guards ();
                                                                                                                                                                                                                        PsdlParser.check_exception_list ();
                                                                                    PsdlParser.check_output_guards ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PsdlParser.check_parent_spec ();
                                                                                                                                                                                                                                                                   case CHECK_TIMER_OPS :
   PsdlParser.check_timer_ops ();
                                                                                                                                                                                                                                                                                                                                                           PsdlParser.informal_desc ();
                                                                                                                              case CHECK_EXCEPTION_GUARDS :
                                                                                                                                                                                                                                                                                                                                                                                                                     PsdlParser.formal_desc ();
                   PsdlParser.expression ();
                                                                                                                                                                                                                                                                                                                                    case INFORMAL_DESCRIPTION :
                                                               case CHECK_OUTPUT_GUARDS :
                                                                                                                                                                                                case CHECK_EXCEPTION_LIST
                                                                                                                                                                                                                                                                                                                                                                                               case FORMAL_DESCRIPTION :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      case CHECK_PARENT_SPEC :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    } catch (ParseException e) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PsdlParser.psdl ();
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              } catch (TokenMgrError e) {
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      System.out.println (e);
case EXPRESSION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  case DATA_TYPE :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           flag = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             flag = false;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           flag = false;
                                                                                                                                                                              break;
                                                                                                                                                                                                                                                                                                                break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               break;
                                             break;
                                                                                                            break;
                                                                                                                                                                                                                                                 break;
                                                                                                                                                                                                                                                                                                                                                                                 break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       default:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           break;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  structure");
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               292
```

LIST OF REFERENCES

- [1] Luqi and R.Steigerwald. Rapid Software Prototyping. IEEE Software, 1992.
- [2] Luqi, Valdins Berzins and Raymond T. Yeah. A Prototyping Language for Real-Time Software. IEEE Transactions on Software Engineering. October 1988.
- [3] Luqi and Mohammed Ketabchi. A Computer Aided Prototyping System. IEE Software, March 1988.
- [4] Kenneth B. Moeller. Evolution of a Graphical User Interface for the Rapid Prototyping of Real-Time Embedded Systems. Master's thesis. Naval Postgraduate School. September 1997.
- [5] The Java (TM) Development Kit 1.2, http://www.javasoft.com/products/jdk/1.2/, March 1999

INITIAL DISTRIBUTION LIST

| 1. | Defense Technical Information Center | 2 |
|----|--|---|
| | 8725 John J. Kingman Road, Ste 0944 | |
| | Ft. Belvoir, VA 22060-6218 | |
| 2. | Deniz Kuvvetleri Komutanligi | 2 |
| | Personel Daire Baskanligi | |
| | Bakanliklar | |
| | Ankara, TURKEY | |
| 3. | Deniz Harp Okulu Komutanligi | 1 |
| • | Kutuphane | |
| | Tuzla | |
| | Istanbul, TURKEY | |
| 4. | Dudley Knox Library | 2 |
| | Naval Postgraduate School | |
| | 411 Dyer Rd. | |
| | Monterey, CA 93943-5101 | |
| 5. | Chairman, Department of Computer Science | 1 |
| | Code CS | |
| | Naval Postgraduate School | |
| | Monterey CA 93943 | |

| 6. | Dr. Mantak Shing, Code CS/Sh | 1 |
|----|--------------------------------|---|
| | Computer Science Department | |
| | Naval Postgraduate School | |
| | Monterey, CA 93943 | |
| 7. | Dr. Valdis Berzins, Code CS/Be | 1 |
| | Computer Science Department | |
| | Naval Postgraduate School | |
| | Monterey, CA 93943 | |
| 8. | Prof. Luqi, Code CS/Lq | 1 |
| | Computer Science Department | |
| | Naval Postgraduate School | |
| | Monterey, CA 93943 | |
| 9. | LTJG Ilker Duranlioglu | 3 |
| | 68 Sokak No 13/12 | |
| | Uckuyular | |
| | Izmir, TURKEY | |